



Concise Explanatory Statement and Responsiveness Summary

For the adoption of:

CHAPTER 173-157 WAC

Underground Artificial Storage and Recovery

January 2003

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As required by the Washington State Administrative Procedure Act, RCW 34.05.

**Concise Explanatory Statement
and
Responsiveness Summary**

**for the adoption of
Chapter 173-157 WAC
Underground Artificial Storage And Recovery**

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CONCISE EXPLANATORY STATEMENT

I. Introduction and Background

What is the background to this rule adoption?

As a result of increasingly competing demands for water use in the state, the Legislature has identified the storage of water for future recovery as a viable and important approach to augment water availability in certain situations. Specifically, the 2000 Legislature broadened the possibilities for underground storage of water in the state and directed Ecology to establish standards to ensure that such storage activities do not have adverse effects on the environment.

In the 2000 session, the Washington State Legislature passed Engrossed Second Substitute House Bill 2867, which expanded the definition of “reservoir” in RCW 90.03.370 to include, “any naturally occurring underground geological formation where water is collected and stored for subsequent use as part of an underground artificial storage and recovery project.”

The legislation also directed the Department of Ecology to adopt a rule identifying the standards to be met by any underground geological formation which is utilized by an Aquifer Storage and Recovery (ASR) project. This rule will establish the standards for review of proposals and mitigation of any adverse impacts described in new subsection RCW 90.03.370 (2)(a). Engrossed House Bill 2993 added additional amendments that will impact the rule language. The rule will be adopted as a new chapter of the Washington Administrative Code.

What is the purpose of this rule?

The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and, standards for identification and mitigation of potential adverse impacts to ground water quality or the environment. WAC 173-157 outlines the process the department of ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Under this proposal, an application for a reservoir permit for an ASR project must contain, at a minimum:

- (1) A general description (conceptual model) of the hydrogeologic system prepared and certified by a hydrogeologist licensed in the state of Washington.
- (2) A project operation plan with a general description of the pilot and operational phases of the ASR project prepared and certified by an engineer or geologist licensed in the state of Washington.
- (3) A description of the legal framework for the proposed project.
- (4) An environmental assessment and analysis of any potential adverse conditions or potential impacts to the surrounding environment that might result from the project.
- (5) A project mitigation plan, if required.
- (6) A project monitoring plan.

What is the statutory authority for this rule?

RCW 90.03.370(2)(b)

RCW 90.44.460

When is this rule scheduled for adoption and when will it become effective?

This rule is scheduled for adoption on December 20, 2002. The rule will become effective thirty-one days after it is filed with the Office of the Code Reviser.

II. Differences between the Proposed and the Adopted Rule

As a result of public comment and additional internal review, the final rule has been revised from the version known as the proposed rule. Those revisions are discussed below. Only sections where a revision was made are included in this document. Text deleted from the proposed rule is in strikethrough format and the new text is underlined.

Chapter 173-157 WAC

**UNDERGROUND ARTIFICIAL STORAGE AND RECOVERY
PART I INTRODUCTION**

WAC 173-157-010 What is the purpose of this rule?

The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and when necessary to identify options for mitigation of potential adverse impacts to ground water quality or the environment. The rule also outlines the process the department of ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Reason for change:

The language was added for clarification.

WAC 173-157-030 To whom does this rule apply?

This rule applies to any firm, association, water users' association, corporation, irrigation district, ~~or~~ municipal corporation, or anyone else that intends to obtain a reservoir permit to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370. This chapter does not apply to projects utilizing irrigation return flow, or to operational and seepage losses that occur during the irrigation of land, or to water that is artificially stored due to the construction, operation, or maintenance of an irrigation district project, or to projects involving water reclaimed in accordance with chapter 90.46 RCW.

Reason for change:

The language was added for clarification.

WAC 173-157-040 What are the meanings of words and phrases used in this rule?

"Aquifer storage and recovery project," "ASR project," or "underground artificial storage and recovery project" means those projects where the intent is to artificially store water in an underground geological formation through injection, surface spreading and infiltration, or other department-approved method, and to make subsequent use of the stored water.

"Artificial recharge" means either controlled subsurface addition of water directly to the aquifer or controlled application of water to the ground surface for the purpose of replenishing the aquifer.

"Beneficial use" includes, among others, uses for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, thermal power production, municipal, and preservation of environmental and aesthetic values.

"Confined aquifer" means an aquifer where the permeability of the beds above and below the aquifer is significantly less than that of the aquifer itself.

"Department" means the Washington department of ecology.

"DOH" means the Washington department of health.

"Hydraulic continuity" means the existence of some degree of interconnection between two or more sources of water, either surface water and ground water or two ground water sources.

"Hydrogeology" means the science that studies the properties of water and their effects on the physical environment, and vice versa, as it moves above and below the earth's surface.

"Normative flow" means a flow that resembles the natural flow enough to sustain all life stages of species, including salmonid populations, native to the particular stream.

"Permeability" means the ability for a fluid to be transmitted in porous rock, sediment, or soil.

"Piezometric elevation" means the static level to which the water from a given aquifer will rise under its full head.

"Reservoir permit" means a permit to artificially store water in underground geological formations and subsequently recover it for beneficial use.

"RCW" means the Revised Code of Washington.

"Receiving aquifer" or "reservoir" means any portion of a naturally occurring underground geological formation in which the source water will be collected and stored for a future beneficial use as part of an ASR project.

"Reservoir permit" means a permit to artificially store water in underground geological formations and subsequently recover it for beneficial use"

"SEPA" means the State Environmental Policy Act, chapter 43.21C RCW.

"Secondary permit" means a permit for the appropriation of ground water which was artificially stored in underground geological formations for subsequent beneficial use.

"Source water" means water that will be stored in a receiving aquifer.

"Stored water" means water that has been stored in a receiving aquifer pursuant to a reservoir permit issued in accordance with the provisions of this chapter.

"Transmissivity" means the rate at which the water travels within the aquifer based upon the viscosity of the water, and the gradient and saturation of the aquifer.

"UIC" means the Underground Injection Control program, which was created by the U.S. Environmental Protection Agency in response to federal legislation (the Safe Drinking Water Act) and is administered by the department's water quality program.

"Vadose zone" means the water vapor above the ground water level within an aquifer.

"WAC" means the Washington Administrative Code.

"You" and "I" means any firm, association, water users' association, corporation, irrigation district, municipal corporation, or anyone else that intends to obtain a reservoir permit to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370.

Reason for change:

These definitions were added to clarify the meanings of terms used within this rule.

WAC 173-157-050 What authorization is required for an ASR project?

The following permits or authorizations are required:

(1) Water rights to source waters.

(a) Any source water you use as part of a project by diverting from a state watercourse or withdrawing state ground waters, must be obtained under a valid water right permit, certificate, or registered water right claim.

(b) The underlying water right specifies authorized uses. Any ~~changes to these proposal~~ to use stored water for different uses will require issuance of a secondary permit.

(2) Reservoir permit. When proposing to collect and store water in a naturally occurring underground geological formation for subsequent use as part of an ASR project, you must apply for a reservoir permit in accordance with the provisions of RCW 90.03.370 (2)(a).

(3) Secondary permit. You must apply for a secondary permit in accordance with the provisions of RCW 90.03.370 if you propose to apply the water stored in a reservoir to a beneficial use, except that you are not required to apply for a secondary permit if you already have a water right for the source ~~of the stored~~ water that authorizes the proposed beneficial use.

(4) UIC registration. All UIC wells to be utilized as part of an ASR project must be registered with the department in accordance with the provisions of chapter 90.48 RCW.

Additionally, the construction and technical aspects of the injection wells must abide by UIC regulations as stated in chapter 173-248~~160~~ WAC.

(5) NPDES permit. Discharges to surface water must meet water quality standards set forth in chapter 173-201A WAC to protect aquatic life.

Reason for change:

The language was added for clarification. In WAC 173-157-050(5), reference to an additional (NPDES) permit that will be needed for an ASR project was added.

PART II APPLICATION PROCESS

WAC 173-157-100 What should I know before I apply?

(1) You must assess potential impacts to the hydrogeologic system and the environment prior to submitting your application. If your application does not describe the general setting and conditions with sufficient information for the department to assess the application, the department may require you to perform a detailed feasibility study. This feasibility study should reduce uncertainty ~~on~~ of the impacts, and better quantify the available storage ~~within~~ capacity of the aquifer.

(2) To further reduce uncertainty, you must design a pilot phase for ~~of~~ the project, to be used to collect data that will validate the conceptual model, monitor efficacy, and adjust the monitoring, operation, and mitigation plans ~~plan~~ based upon results. The duration of this phase will be determined by the complexity of the project and stated within the reservoir permit.

(3) You may schedule a preapplication meeting with the department to discuss the project plan and likely requirements for monitoring and mitigation.

Reason for change:

These revisions better define the intent of the pilot phase.

WAC 173-157-110 What types of information will I need to provide as part of my application?

Your application for an ASR project must contain, at a minimum:

(1) A ~~general~~ description (conceptual model) of the hydrogeologic system (see WAC 173-157-120) prepared ~~and certified~~ by a hydrogeologist licensed in the state of Washington.

(2) A project operation plan (see WAC 173-157-130) with a ~~general~~ description of the pilot and operational phases of the ASR project prepared ~~and certified~~ by an engineer or geologist licensed in the state of Washington.

(3) A description of the legal framework (see WAC 173-157-140) for the proposed project.

(4) An environmental assessment and analysis (see WAC 173-157-150) of any potential adverse conditions or potential impacts to the surrounding ~~environment~~ ecosystem(s) that might result from the project, along with a plan to mitigate such conditions or impacts.

The environmental assessment will establish whether a determination of nonsignificance or an environmental impact statement is required per SEPA regulations.

(5) A project mitigation plan (see WAC 173-157-160), if required.

(6) A project monitoring plan (see WAC 173-157-170).

Reason for change:

These revisions were made to better relate to and reference the rule language within other sections.

WAC 173-157-120 What must I include in the hydrogeologic system description?

Your hydrogeologic system description must include a conceptual hydrogeologic model that describes:

- (1) The aquifer targeted for storage, to include at a minimum estimates for:
 - (a) Lateral and vertical extent;
 - (b) Whether the aquifer is confined or unconfined;
 - (c) Permeability;
 - (d) Total storage volume available;
 - (e) Effective hydraulic conductivity;
 - (f) Transmissivity; and
 - (g) Potential for physio-chemical changes in the aquifer or vadose zone as a consequence of recharge. ~~introduction of precipitates into the ground water when normally dry formation is recharged.~~
- (2) The estimated flow direction(s) and rate of movement.
- (3) The anticipated changes to the ground water system due to the proposed ASR project.
- (4) The estimated area that could be affected by the project.
- (5) The general geology in the vicinity of the proposed project, including stratigraphy and structure.
- (6) The locations of existing documented natural hazards that could be affected or exacerbated by the project, such as landslide-prone areas or areas of subsidence, along with a plan to mitigate such conditions or impacts.
- (7) The locations of surface waters such as springs, creeks, streams or rivers that could be affected by the ASR project.
- (8) The locations of all wells or other sources of ground water of record within the area affected by the project.
- (9) ~~The chemical composition of the source water and its compatibility with the naturally occurring waters of the receiving aquifer.~~ The chemical and physical composition of the source water(s) and their compatibility with the naturally occurring waters of the receiving aquifer

Reason for change:

The language was added for clarification.

WAC 173-157-130 What must I include in the project operation plan?

Your project operation plan should include, at a minimum, the following information:

- (1) The quantity and times of year source water is available for recharge.
- (2) The proposed rate of injection and withdrawal of water.
- (3) The length of time the water is proposed to be stored.
- (4) The location, number, and capacity of proposed recharge wells or infiltration basins, and recovery facilities.
- (5) Any variability in quality and reliability of the source water.
- (6) A description of ~~the~~ any water treatment method(s) you will use at the time of injection and recovery to ensure compliance with the water quality standards set forth in chapter 173-200 WAC, as well as the department's antidegradation policy. ~~The department shall give strong consideration to the overriding public interest in its evaluation of compliance with ground water quality protection standards.~~
- (7) Any plans to ~~aerate, if required, when pumping water out of an aquifer for stream augmentation~~ discharge ASR water to a surface body should include information on the quantity, timing, duration, and water quality parameters such as chlorine, pH and dissolved oxygen of the ASR discharge water.
- (8) Any operation and maintenance plans to ~~flush out the injection system to dislodge sediment which can cause clogging~~ discharge ground water and suspended sediment from the ASR well shall provide information on the quantity, duration, quality, and means of discharge.
- (9) Destination(s) ~~for waste water~~ and permitting for water used for operation and maintenance (e.g., flushing water).

Reason for change:

The language was amended to clarify the treatment requirements for ASR water being discharged to a surface water body, and why an ASR project would produce waste water. The reference to considering overriding public interest was appropriately moved to section 173-157-200.

WAC 173-157-140 What must I include in the description of the legal framework?

Your description of the legal framework should include, at a minimum:

- (1) Documentation of the water rights for ~~allowing use of~~ the source waters intended to be stored for the proposed ASR project.
- (2) A list of other water rights within the ASR project area.
- (3) Instream flows established by the department or stream closures in the vicinity of the point of diversion/withdrawal of the source water and/or within the ASR project area.
- (4) Ownership and control of any facilities to be used for the proposed project.

Reason for change:

The language was added for clarification.

WAC 173-157-150 What must I include in the environmental assessment and analysis?

Your environmental assessment and analysis must, at a minimum, describe:

- (1) The environment within the ASR project area, including:
 - (a) Proximity to contaminated areas;
 - (b) Present and prior land use(s) within the ASR project area;
 - (c) Location(s) of historical or existing wetland habitat(s);
 - (d) Location(s) of historical or existing flood plain(s);
 - (e) Location(s) of historical or existing surface water body or spring, including ~~known~~ documented:
 - (i) Base flows;
 - (ii) Seven-day low flows;
 - (iii) Maximum flows;
- (2) ~~Potential~~ Adverse impacts to the surrounding environment by the ASR project, including, but not limited to:
 - (a) Slope stability
 - (b) Wetland habitat;
 - (c) Flood plain;
 - (d) Ground deformation;
 - (e) Surface water body or spring.
- (3) If an environmental assessment has already been performed for the purposes of this specific ASR project, the application may simply refer to that documentation and need not repeat that analysis.

Reason for change:

The language was amended for clarification. Examples of adverse impacts were appropriately moved from section 173-157-160. Subsection (3) was added to ensure the applicant is aware that no duplication of effort is required.

WAC 173-157-160 What must I include in the project mitigation plan?

Your project mitigation plan, if necessary, ~~which~~ must be reviewed and approved or prepared by an appropriately experienced engineer licensed in the state of Washington. The mitigation plan shall prescribe actions to be taken to prevent adverse impacts to the environment and methods for evaluation of the effectiveness of these actions. ~~shall include actions adequate to mitigate for any identified potential impacts to the environment, such as:~~

- ~~—— (1) Slope stability;~~
- ~~—— (2) Wetland habitat;~~
- ~~—— (3) Flood plain;~~

- ~~————(4) Ground deformation;~~
- ~~————(5) Surface water body or spring.~~

Reason for change:

The language was amended to clarify the role of the mitigation plan. Examples of adverse impacts were appropriately moved to section 173-157-150.

WAC 173-157-170 What must I include in the ~~data~~ project monitoring plan?

Your ~~data~~ project monitoring plan, which will be utilized to evaluate and verify the assumptions in the conceptual model, during the pilot and operational phases, must include the following:

- (1) Proposed time intervals for sampling and subsequent reporting.
- (2) Descriptions of measurement methodology, threshold values, and evaluation techniques for the following criteria:
 - (a) The quality of the source and receiving waters. This information must be provided for the period or periods of the year when the water will be stored. Testing must be done by a laboratory certified by either the department or DOH.
 - (b) The actual quantity of water injected.
 - (c) Changes in ground water piezometric elevations in the receiving aquifer.
 - (d) The percentage of the initial amount of stored water that is recoverable after varying lengths of storage time to validate the estimates of the amount of stored water that is actually recovered.
 - (e) Data necessary to evaluate the effectiveness of required mitigation.
 - (ef) Other data you or the department determine necessary ~~deem important~~ for monitoring the ASR project and ~~potential~~ adverse impacts.

You must provide a report of the monitoring data, at least annually, to the department. Based on the complexity of the project, the department may require you to comply with a more frequent reporting schedule. The required reporting frequency will be ~~documented~~ specified in the reservoir permit.

Reason for change:

The language was amended for clarification. Subsection (2) (e) was added to include required information that was implied but not specifically mentioned.

PART III APPLICATION REVIEW PROCESS

WAC 173-157-200 How will the department issue reservoir permits and/or secondary permits for ASR projects?

(1) The department will process applications for permits for ASR projects in accordance with the provisions of RCW 90.03.250 through 90.03.320, RCW 90.03.370, chapter 173-152 WAC and this chapter. The department shall expedite processing applications for those projects that:

- (a) Will not require a new water right for diversion or withdrawal of the water to be stored;
- (b) Are adding or changing one or more purposes of use for the stored water;
- (c) Are adding to the storage capacity of the an existing reservoir; or
- (d) Are applying for the secondary permit to secure use of water stored in the an existing reservoir.

(2) The department shall give strong consideration to the overriding public interest in its evaluation of compliance with ground water quality protection standards.

(3) Any application considered under this chapter that may impact surface waters will be subject to review by ~~a Washington, WDFW, DOH, and the appropriate Indian tribe(s), department of fish and wildlife water rights biologist,~~ specifically to ensure that the following do not occur during ~~or after ASR project diversions or withdrawals~~ ASR project injections or withdrawals:

- (a) ~~Erasure or a~~ Alteration of the normative hydrograph which may result in adverse impacts to fish ~~natural flow peaks~~;
- (b) Detrimental changes in temperature, ~~and~~ nutrient, heavy metals, hydrocarbon, or other deleterious material levels during critical spawning and rearing periods;
- (c) Disruption of natural downwelling or upwelling within stream during critical spawning and rearing periods; or
- (d) Saturation of stream bank which could lead to erosion, ~~and~~ bank failure, and excess sedimentation entering the stream which can alter stream chemistry, flow, and bed morphology.

Each ASR project application will be subject to public notice and comment per RCW 90.03.280. The department will consider any comments by the reviewers in evaluating the application.

~~The department will consider comments by the water rights biologist in determining whether the project will be detrimental to public welfare.~~

(34) The department may issue a conditioned permit. ~~For example, conditions may be imposed~~ to prevent any long-term changes to the aquifer, or other adverse impacts to the environment. ~~Such~~ The conditioning ~~would~~ will provide for a pilot phase of the project, to be used to collect data, monitor efficacy, evaluate the effectiveness of any mitigation plan approved under WAC 173-157-150, and adjust the ASR project or mitigation plan based upon pilot phase results.

(45) Permits will contain a schedule for:

- (a) Development and completion of the project;
- (b) Monitoring and reporting during the pilot and operational phases of the project.

(56) The department can, upon a showing of good cause, issue extensions for the permit in accordance with the provisions of RCW 90.03.320.

(67) Once sufficient information is developed and provided to the department to verify that the project is ~~indeed~~-viable and the requirements of RCW 90.03.330 have been met, the department will issue proper documentation for the reservoir and secondary permit, if any, ~~certificate~~ with the priority date or dates based on the underlying source ~~or sources~~ of water right.

Reason for change:

The language was amended to clarify who is involved and what is being evaluated in the ASR application review process. The reference to consideration of overriding public interest was appropriately moved from section 173-157-130.

III Responsiveness Summary

Section – General

Comment:

CHELAN COUNTY BOARD OF COMMISSIONERS

Thank you for the opportunity to comment on the Department of Ecology’s rule-making procedures to permit the issuance of reservoir permits to authorize aquifer storage and recovery projects. Chelan County supports the Legislature’s expansion of the definition of “reservoir” in RCW 90.03.370 to include not only surface waters but also underground water systems. Chelan County is currently engaged in various water supply planning processes and projects, including watershed planning, the Lake Wenatchee Water Storage Feasibility Study, and the Upper Columbia Salmon Recovery Board. We have recognized through these efforts that creative solutions will be necessary to address our County’s water supply needs. We are optimistic that Ecology’s rule-making procedure for aquifer storage and recovery will result in a streamlined permitting process for potential ASR projects. Again, thank you for the opportunity to comment.

Comment:

**George H. Schneider, P.E., Water Resource Manager,
Seattle Public Utilities**

This letter is in response to the Department of Ecology’s request for comments on the draft rule for permitting underground artificial storage and recovery (ASR) projects in the State of Washington. Seattle Public Utilities sent a representative to the Technical Advisory Group that was convened in July 2000 to assist in the development of ASR rules. Earlier, Seattle Water Department conducted a feasibility study, funded largely by grant from the U.S. Bureau of Reclamation, on the application of the ASR technique in the Highline Well Field. We support ASR as a potentially valuable means for making effective use of both surface water and groundwater resources.

We have reviewed the draft rule that is circulating for public review and are impressed by its clarity. It appears to cover the subject at the appropriate level of detail, while leaving sufficient latitude to the DOE regulator and the ASR project applicant in the planning and conduct of feasibility studies.

We would like to express our appreciation for the efforts made by DOE staff in making the rule development a collaborative process of regulators, potential ASR project applicants, and consultants with very considerable expertise in geohydrology. Hopefully, this will result in a permitting process that addresses all critical operational and environmental aspects of ASR while recognizing that the actual locales vary considerably and that feasibility studies need to be site specific. Thank you for the opportunity to participate in the rule-making process.

Comment:

Donald C. Wright, Administrator

South King County Regional Water Association

On behalf of the South King County Regional Water Association we appreciate the opportunity to review and comment on the Proposed Aquifer Storage and Recovery (ASR) Rule (Draft WAC 173-157). The South King County Regional Water Association is made up of the cities of Algona, Auburn, Black Diamond, and Kent along with Lakehaven Utility District, Soos Creek Water and Sewer District, and Water District 111. Our members have long supported the concept of aquifer storage and recovery and are fully supportive of efforts to provide the necessary regulations to allow pilot testing and eventual full implementation of the concept. We believe that ASR will be an important tool in the management of water resources in the future of our region.

As an Association, we have asked Lakehaven Utility District to take the lead in implementation of ASR and the associated rulemaking. We have followed the process and have been pleased with the process as reported by Lakehaven through John Bowman.

At our August meeting our Board of Directors voted to support the comments on the proposed rules as developed by Lakehaven Utility District.

Again we thank you for the opportunity to comment on the proposed rule. We look forward to the ASR rule being finalized and moving onto implementation of this important water resource management tool.

Response: Thank you for your comments. We agree that ASR is a valuable tool that will aid in the effort to meet the water demands of both people and fish. We hope this process provides an uncomplicated avenue for the implementation of several successful projects in the state of Washington.

Comment:

Mark Gagnon and Tadd Giesbrecht, Brown and Caldwell

The question and answer format is atypical. The format makes it difficult for the permittee to respond to, especially if their question is not one of those addressed. It seems that the format would restrictively steer the type of responses the agency will get and that there would be little recourse to require additional facts outside the scope of the rules.

Response: We have found that some users prefer the question and answer format to the typical format used when writing WAC codes. The questions used are typical to questions the reader is asking when attempting to use the rule to find information. The question headings are meant to be broad providing the reader with cues as to what information can be found in each section of the rule.

There is still language in the rule that allows the department to request additional information/facts, when necessary, to approve the ASR permit. Example: WAC 173-157-170(2)(e) Data necessary to evaluate the effectiveness of required mitigation.

Comment:

Victoria Welch, member, Methow Valley Ground Water Advisory Committee

We live on Twisp River where the USGS has recently completed a study showing a fall return of 10 cfs to instream flows from irrigation canal groundwater recharge. In consideration of this and other similar data, we feel the Aquifer Storage Plan should be modified to include and credit irrigation canals for their help with aquifer recharge. Irrigation canals' contribution to aquifer recharge should be evaluated before efficiency improvements are required. Water lost in ditch transport should be considered beneficial use if it is serving to recharge the aquifer. Alluvial soils should be included in aquifer definition. Thank you for this opportunity to comment.

Comment:

George Wooten, Methow Valley Citizens' Council

Now that this law is in place, the value of contributions from irrigation canals needs to be accounted in water budgets. Our research and that of USGS in the Methow Valley indicated that static water tables are indeed correlated with irrigation canal contributions. In some instances, the flow contributions from inputs and outputs are asymmetric, meaning that ground water contributions rise faster in the spring and fall slower in the fall, with a corresponding benefit to downstream flows, including salmon, which are limited by fall and winter low flows.

Comment:

Janie Lewis

I would like to use this opportunity to address the DOE's new aquifer storage and recovery rule. I request that you include irrigation canal aquifer storage in your drafting of the possible storage rulings. These

agriculturally created reservoirs are in the soils of the Methow Valley. These soils hold the water and slowly release it during the months of late summer into the winter, when instream flows are low. It would behoove DOE to help maintain the agricultural portion of the Methow Valley, as these rural practices actually contribute to the well-being of our watershed. Please do what you can to preserve an already created water reservoir system. Thank you for your consideration in this matter.

Comment:

Sondra Shulman

I am protesting the closure of the ditches in the Methow Valley. I have seen the devastation this closure has done at Twin Lakes and I do not wish to see it repeated in other parts of the Valley. I have owned property here for almost twenty years and have seen many changes. The one at Twin Lakes is the worst. I am ardently for conservation but I am curious about why no study has been done on the importance of alluvial soils and why transportation water from earthen canals for aquifer recharge are not being considered. I also rely on the small farms here for my produce as do many others. If we didn't have them we would either have to grow our own, probably using water less efficiently, or obtain produce from outside our area. This too would involve use of other natural resources. I would appreciate an answer. We are on the same side as far as the environment is concerned. But I believe that our ends can be accomplished in more than one way.

Comment:

Tom Clingman, Thurston County Department of Water and Waste Management

We may be missing an opportunity to provide guidance for ASR projects using reclaimed water under RCW 90.46 through the proposed rule. The rule expressly does not apply to reclaimed water produced under RCW 90.46. Although it is vital to make a clear distinction between “water right water” and “reclaimed water”, much of the rule appears to apply equally to either “type” of water. It will be vital to both applicants and the Department that clear guidance is provided regarding proposed recovery of recharged reclaimed water. It seems we may be missing an opportunity to provide such guidance by not including reclaimed water in the pertinent technical sections of the rule. It is anticipated that the municipal utilities in our region may desire to submit applications to recover water infiltrated from LOTT recharge basins. Infiltrating Class A water. In the north Thurston County region, the municipal utilities (LOTT) are anticipating making significant investment in Class A Reclaimed Water facilities. Groundwater recharge is anticipated to be a major use of this water; groundwater infiltration basins will be included with each satellite reclaimed facility sized to accommodate 100% of plant capacity. The plants will start with 1 mgd capacity, with future additions of 1 mgd units up to 5 mgd total. Three of these satellite facilities are planned to be ultimately constructed. Only a few sections in the rule address water rights such as 173-157-180 and are thus expressly inapplicable to reclaimed water. Some sections would need to be revised, as they mix water right procedures with

substantive review issues (ex. 173-157-200(2) regarding WDFW review). It would seem that the issue of keeping “water right water” and “reclaimed water” separate could be clearly addressed while not missing the opportunity to provide clarity to reclaimed water ASR proposals through the guidance in this rule. Unfortunately, due to the express exclusion of reclaimed water from the draft rule, my colleagues and others interested in reclaimed water ASR may not have conducted detailed review of the draft. If the rule guidance is extended to reclaimed ASR, opportunity for detailed review and comment should be provided.

Comment:

Dale Tyler, President, Camano Water Systems Association

Camano Water Systems Association (CWSA) request, to you and thru you, to the legislature, a continuance for further (ASR) benefits. (ASR) as written is an “end use”. There exist many opportunities for tax dollars and profit prior to (ASR) being in place regulatory wise that otherwise will curtail innovative thinking using “free water” (storm water run off). Injection wells are but one method to get water to the aquifers. Prior to (ASR) revenue and tax dollars can be spin off making such infrastructure profitable. Recycling run off coupled with transportation and/or harvested products all make use of “free water” prior to (ASR). Timing of this action is essential to innovative water useage. This great state could lead the nation in water and waste water useage. **Storm water run off is money don’t waste it accumulate it.** There fore we request at least a year extension be granted for (ASR) and a call for papers be requested on this subject.

Comment:

Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell

WAC 173-157-030 references that this rule does not apply to "projects involving water reclaimed in accordance with Chapter 90.46 RCW." This needs some clarification.

Response:

Your comments are appreciated; however, currently RCW 90.03.370(3)(a) states: “this subsection does not apply to irrigation return flow, or to operational and seepage losses that occur during the irrigation of land, or to water that is artificially stored due to the construction, operation, or maintenance of an irrigation district project, or to projects involving water reclaimed in accordance with chapter 90.46 RCW.” To address your concerns would require a change to the statute, and the department does not have the authority to do so.

Comment:

George Wooten, Kettle Range Conservation Group

There is not currently enough information on system characteristics of any aquifers that would allow determining a water budget that includes withdrawals as well as inputs.

Comment: **George Wooten, Methow Valley Citizens' Council**
The volume and static levels of ground water aquifers are difficult to measure, making the process ripe for government mismanagement.

Comment: **George Wooten, Methow Valley Citizens' Council**
Lack of information on the volume and static levels of ground water aquifers will make it easy to compromise fair water allocation. In particular, well-funded interests will be more able to establish new rights at the expense of other users.

Response: The application for an ASR project will include a conceptual or mathematical model of the hydrogeology in the ASR project area. The pilot phase is utilized to verify the model. Several active ASR projects throughout the state and country have successfully modeled and validated the amount of water able to be stored and retrieved. The terms of the permit will be based upon the information provided in the application. The public notification process provides the opportunity to express any concerns with the terms of the permit.

Comment: **George Wooten, Kettle Range Conservation Group**
Any proposal to manage aquifers as a water bank should account for historical capacity of the aquifer, current capacity, amount of added water, amount of withdrawn water and water quality changes.

Comment: **George Wooten, Methow Valley Citizens' Council**
DOE should not establish new water rights until the additional volume of new aquifer water is established. It is not equitable to permit new uses, if water added to an aquifer is not actually increasing the aquifer volume, as would happen if outflow rates were far greater than inflows. Yet unless the volume by which the aquifer increased is known and duly considered by DOE, projects of dubious value and granting of nonexistent "new" water will be the result. The problem is that the current water right granting process is already occurring under DOE regulations, and this new process must be smoothly incorporated if it is going to work. We are skeptical, given the current backlog of current water right approvals.

Response: ASR projects are not managed like a water bank. Any water added to an aquifer by an ASR project can only be recovered by said project. The rule provides adequate safeguards. All your concerns are covered within the application and review process set forth in the draft rule language; specifically WAC 173-157-120 through WAC 173-157-170.

Comment:

George Wooten, Kettle Range Conservation Group

Many aquifers are currently fed by irrigation canals. DOE has supported lowering agricultural rights and raising development rights in areas where development is not currently the main use. The new proposal would affect rights of agricultural users by expediting canal closures.

Response: All ASR projects must operate under a valid water right. A reservoir permit to store water for future beneficial use will not alter the seniority date, times of withdrawal, or amount of total annual diversion of existing rights.

Comment:

George Wooten, Kettle Range Conservation Group

DOE may be liable for loss of water rights if this legislation is approved. The proposal would not work in all areas, e.g., where no alternate source of recharge is available. Some water users would benefit from the proposal, while others would not, thus making DOE liable for accounting for the unequal treatment under the law.

Response: The success of an ASR project is dependent on the hydrogeology of an area, available resources, and comprehensive planning. All existing water rights are entitled to protection against impairment. Anyone can apply for a permit to withdraw or divert water from a surface or ground water source, and then to store surplus water in an underground geological formation for future beneficial use. While ASR might be feasible in all areas of the state due to hydrogeological limitations, the benefits of ASR are worth pursuing in areas where it can be achieved.

Comment:

George Wooten, Kettle Range Conservation Group

A suitable source of recharge water must be available beforehand.

Response: We agree. Section 173-157-140(1) states “[d]ocumentation of the water rights allowing use of the source waters...” is required at time of application.

Comment:

George Wooten, Kettle Range Conservation Group

Modifications of groundwater flows is currently against the law.

Response: Ecology is unaware of any provision that would indicate that modification of ground water flows is currently against the law. Moreover, the purpose of ASR is not to modify ground water flows but to promote artificial storage and recovery of water placed in an aquifer.

Comment:

George Wooten, Methow Valley Citizens' Council

We feel that DOE needs to consider both the advantages and disadvantages of the proposal for allowing the DOE to review projects designed to store ground water. Since the DOE has already considered the advantages, we would like to comment on some potential disadvantages of the proposal.

Response:

RCW 90.44.460 states: "The legislature recognizes the importance of sound water management. In an effort to promote new and innovative methods of water storage, the legislature authorizes the department of ecology to issue reservoir permits that enable an entity to artificially store and recover water in any underground geological formation, which qualifies as a reservoir under RCW 90.03.370."

Review of each ASR application will also be performed by the Washington State Departments of Fish and Wildlife and Health, and tribal governments. Opportunity for comment on each individual project is provided to the general public via the public notice process. Therefore any party will have the opportunity to comment on the potential disadvantages of a proposed project.

Comment:

George Wooten, Kettle Range Conservation Group

Water quality changes could impact species in the hyporheic zone with unknown effects. These might be beneficial, or water tables could be artificially raised in some areas causing geologic instabilities.

Comment:

George Wooten, Methow Valley Citizens' Council

This proposal has the potential to impact water quality. For instance, if current water tables are raised into toxic areas such as old landfills or former uplands where lead arsenate from old orchards, feedlot operations, or mining operations previously existed, it may lead to heightened movement of toxic materials into water tables. It might be wise to limit the current proposal to managing ground water that stays below the ground, as newly created riparian areas and springs could constitute a resource requiring additional rulemaking.

Comment:

George Wooten, Methow Valley Citizens' Council

The definition of ground water recharge will be impacted if added water emerges at the surface. The current proposal and new legislation will be problematic if new streams are created by the process of aquifer augmentation. It could become a legal quagmire.

Comment:

George Wooten, Methow Valley Citizens' Council

The process of aquifer recharge needs to be well-documented. It will be important to determine how and when new water be added, as well as the purity. It will be important to consider the differences in soil types. Alluvial soil types are dominant in northern Washington. These charge and discharge faster, and have a potentially higher available void volume than most other soils. With the current budget shortfall in Washington, we are skeptical of the ability of DOE to manage this new workload efficiently.

Response: The ASR rules address water quality concerns. The rules also require that the proponent identify and mitigate against any possible adverse effects from the discharge of any artificially-stored water that would affect land surface conditions.

Section 173-157-130(6) states the water must meet "...the water quality standards set forth in chapter 173-200 WAC..." Also, Section 173-157-120 requires that the source and aquifer waters be compatible. Any detrimental effects would need to be identified and addressed in both the environmental assessment and analysis, and the project mitigation plan.

Comment:

George Wooten, Methow Valley Citizens' Council

There should be a new arbitration process to replace the now-outdated surface water arbitration process for granting water rights. Respectfully, George Wooten, Treasurer Methow Valley Citizens' Council

Response: Ecology is unaware of any arbitration for new water rights. If in fact you mean adjudication, that is outside the scope of this rule.

Comment:

Dan Mathias, Utilities Engineer, City of Everett Public Works

Given that the Department of Ecology's 2001 Stormwater Manual stresses the importance of infiltrating stormwater runoff, I believe the proposed rule was not intended to apply to infiltration systems constructed for stormwater management purposes. However, since the definition of beneficial use includes fish and wildlife enhancement and since fish and wildlife protection is typically one of the purposes of stormwater infiltration systems, proposed WAC 173-157-030 could be interpreted to apply to stormwater infiltration systems. Therefore, I recommend that "...or to projects infiltrating stormwater in accordance with a Department-approved stormwater manual" be added at the end of proposed WAC 173-157-030.

Response: Your comment is appreciated. Anyone can apply for a water right and permit to withdraw or divert water from a surface or ground water source and then to store surplus water in an underground geological formation for future beneficial use. The process requires that you possess a primary water right to the water that will be diverted and stored. The infiltration of stormwater in accordance with the Stormwater Manual is beyond the scope of this rule.

Comment: **Dan Mathias, Utilities Engineer, City of Everett Public Works**
The proposed rule does not sufficiently address the wide range in sizes of projects that will be subject to the proposed rule. For example, proposed WAC 173-157-100(2) requires pilot projects for all projects. While pilot projects may be appropriate for large projects, pilot projects will not always be appropriate for small projects. I suggest that a threshold be added to proposed WAC 173-157-100(2) whereby projects below the threshold will not be required to implement a pilot project. Similarly, project size thresholds should be added to proposed WAC 173-157-110 through WAC 173-157-200.

Comment: **Richard Price, Stevens County Public Utility District**
Aquifer recharge via surface infiltration should be allowed with reduced requirements. Perhaps small scale pilot projects should be allowed with reduced planning requirements to help encourage more projects. Especially in rural areas.

Response: Even if a very small volume of water is introduced into the aquifer, the source water must meet drinking water standards prior to spreading and infiltration. A smaller project will most likely require less sophisticated modeling for the feasibility study. The permitting process will define the scope of monitoring and mitigation required based upon the information provided within the application. Therefore, the requirements remain the same, but the costs to propose and test a project and the frequency of monitoring required may be less for less complex or smaller projects.

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
Timing for Review and Issuance of permit?

Response: If the applicant already has a right to the source water, the only requirement is to allow sufficient time to evaluate all aspects of the application for compliance with the ASR rules and for public notice.

RCW 90.03.370(1)(b) states:

*“(b) The department shall expedite processing applications for the following types of storage proposals:
(i) Development of storage facilities that will not require a new water right for diversion or withdrawal of the water to be stored;
(ii) Adding or changing one or more purposes of use of stored water;
(iii) Adding to the storage capacity of an existing storage facility; and
(iv) Applications for secondary permits to secure use from existing storage facilities.”*

Comment:

Art Schick, Suquamish

Hydrogeology of western Washington is complex. Virtually all groundwater is in hydraulic continuity with our surface water. There is demonstrated leakage between aquifer systems. Aquifer storage in the Puget Sound area can generally only be stored for short periods, often days or perhaps weeks.

Response: Ecology recognizes the complexity of the hydrogeology in Western Washington, if not throughout the entire state. Therefore, ASR will not be feasible in all areas. Hydraulic continuity is to be identified in the hydrogeologic system description. Identification of any potential adverse effects and actions required to mitigate are required by the project mitigation plan.

Moreover, at least one project in Western Washington has successfully demonstrated that water can indeed be stored for long periods of time in a well-confined aquifer. Whether a particular part of the state is conducive to a successful ASR project is determined by the geology of that area. Factors vary; availability is based upon length of storage.

Comment:

Margaret Cruse

We have done a successful recharge project and were told by Ecology that our existing water rights would be opened up for review if we applied for an ASR.

Has this changed? If not, changes in the rule are irrelevant.

Response: All recharge projects involving the storage and recovery of water in and from an aquifer are required to apply for a reservoir permit. Any such projects initiated prior to this rule adoption are operating under a temporary permit as “demonstration projects.” Proof of a valid water right to the source water is required for any ASR project and is part of the application process.

Comment:

Margaret Nelson

I am writing in regard to plans to use the Lakehaven Utility District's Mirror Lake aquifer to store water not originally produced by the same aquifer. I wish my comments to be considered part of the public comment period ending Sept. 9 on the Dept. of Ecology's rule on drinking water storage projects

I do not think this is a good idea. I believe that a portion of the water, which will be pumped into the aquifer, will at times have been chlorinated. The new water may come from sources which require that chlorination be done before the water enters the pipeline to LUD, specifically, the Green River water that LUD buys from Tacoma.

In the oil industry, mud is often pumped into a drilling well for lubrication and other reasons. Depending on the formation and the mud composition, problems occur when there is chemical reaction between the clays in the rock formations drilled and the components of the drilling mud. This is not something that can be predicted without prior knowledge of the clay content and composition of the potential producing formation. Chlorine and its compounds in drilling mud have been blamed forming new compounds in the formations near the wellbore itself and reducing the permeability of the formations. Where formerly there appeared to be a good potential producing zone before the chlorine arrived, permeability is reduced and the well now cannot show good flow and must be plugged.

A few years ago. I attended a meeting of the LUD where the topic of pumping "new" pipeline water into aquifers was discussed. I asked the engineer if there had been tests done to make sure that the aquifer was not sensitive to the chlorine which will be in the pipeline water. He said that no tests had been done. Until someone can prove that our aquifers are not sensitive to the chlorine or any other chemicals that may be in the non-aquifer water, I oppose any pumping of "new" water into any of the LUD or other aquifers. It would be a terrible thing to mess up an existing aquifer because no one actually tested for this possibility. Please let me know if this sort of testing has been done recently.

Response:

We appreciate your concerns. A representative for the Lakehaven project informs us that you are correct; they have not injected chlorinated water into the Mirror Lake Aquifer yet. However, there are other agencies around the country, and here in our state (e.g. the city of Seattle, with their Highline Well Field) that have injected chlorinated water into aquifers with good results. The Lakehaven Utility District has pilot tested its recharge process using unchlorinated groundwater so far and will do sufficient pilot testing using chlorinated water as part of developing the project. Plugging of wells is typically caused by particulate matter carried by or precipitating out of the water or from bacterial growth at the

well screen interface, not chlorine. Chlorine will reduce the risk of bacterial growth that can cause plugging. Treatment of the injection water before it goes into a well is usually needed to remove particulate matter that might cause plugging. Wells that begin to show signs of plugging can be rejuvenated by various methods to keep the hole open and productive. For recharge and recovery wells, the simplest method is to cycle from recharge mode to pumping mode for a short duration to flush out any buildup that might have accumulated. Other methods might include surge blocks (like big plungers), blasting caps (very small charges that are non-destructive to the well), cryogenics (a freeze/thaw method), and chemical washing (usually involves a safe acid to lower the pH and dissolve encrustation so it can be pumped out).

You will have the opportunity to comment further on this project during the public notice portion of the permitting process.

Comment:

Pamela Smith

I have a problem and I am hoping that you can advise me.

We purchased 23 acres on Hughes Creek. The original owners (1991) dug a pond out of a wet area and pumped water out of the creek to keep the pond level even. They stocked it with 1000 trout. During the winter the pond stays overflowing from run off of the nearby hills. The excess flows through the pond, the woods, the drainage ditch along Woods Creek Road and into Woods Creek.

The pond is kidney shaped about 100ft wide and 100ft long at its widest longest points.

It is about 16 feet deep when full and is now (during summer drought) about 5-6' deep. Most of the trout have long since died or been eaten. We want to build a wildlife garden here. This is why we bought the property. The pond itself is over run with crayfish, that eat everything we try to plant. My plan is to restock with trout to balance the crayfish and to provide food for the local predatory birds, but I fear during August the water level with get too low and thus too warm.

I have considered using well water, but I am not sure that is an ecologically sound idea. The only other option I can think of is some kind of reservoir that will retain water when it's pouring over this land (not excluding under our house) and save it for the dry months. What I fear hear is that the reservoir itself will, in time, become its own ecosystem, not to mention the one we would have to disrupt to build it.

We are retired and far from millionaires, so budget is limiting too.

We have lots of snakes, frogs, salamanders, lizards, bats, birds etc. that benefit from this area and our aim is to accommodate as many native species as possible, including insects. Any advice you can offer will be

much appreciated.

Response: Thank you for your comment. However, a pond and its ecosystem do not meet the definition of an aquifer and therefore your question is beyond the scope of this rule. We have referred your comment to our Northwest Regional Office. They may be reached at (425) 649-7012.

Comment:

Josh Baldi, Washington Environmental Council

Our most significant concern with the proposed rule regards mitigation. The statute indicates that standards for mitigation shall be established by rule. However, the rule instead creates a list of “elements” for the mitigation plan. When WEC signed off on the final version of HB 2867, we were able to do so in large part based upon the directive that “standards for review and standards for mitigation of adverse impacts for an underground artificial storage and recovery project shall be established by the department by rule.” Standards can be used to assess what is actually happening on the ground; they are outcome based. Elements, on the other hand, merely refer to a step in planning that may or may not have real word impacts. This is a serious flaw in the proposed rule and is in apparent violation of the statute. A second significant problem with this section is there are no assurances that the mitigation itself will be implemented, let alone be effective. The mitigation plan does not require documentation that planned mitigation has occurred, evaluation of success of mitigation efforts or supplementary actions where mitigation fails. There is no mention of the mitigation or the requirements for monitoring and evidence of the success of mitigation is not specified in WAC 173-157-100 (3), which describes the elements of a conditioned permit. These omissions should be corrected in the final rules.

Comment:

Carla Carlson and Richard Reich, Muckleshoot Indian Tribe

The Muckleshoot Indian Tribe is providing comments on the proposed rule governing aquifer artificial recovery and storage. Accompanying this letter please also find comments prepared by Dr. Joel Massmann at the Tribe’s request. The glacial deposits underlying the Puget Sound region make recovery of injected water questionable even after relatively short periods of time. Therefore while under certain circumstances water can be stored underground for some period of time, practical implementation of such underground storage programs in Western Washington is likely to be highly problematic. Given the difficulties that will be encountered in implementing such programs, there is a critical need for rules that provide clear guidelines to protect both the environment and senior water rights from impairment. Unfortunately, the present draft does not fulfill the legislative mandate for the establishment of such standards governing evaluation of underground storage and recovery programs that address: (i) Aquifer vulnerability and hydraulic continuity; (ii) Potential impairment of existing water rights; (iii) Geotechnical impacts and aquifer boundaries

and characteristics; (iv)Chemical compatibility of surface waters and ground water; (v)Recharge and recovery treatment requirements; (vi)System operation; (vii)Water rights and ownership of water stored for recovery; (viii)Environmental impacts. As Dr. Massmann's attached comments note, the Department has removed language from the proposed rule recommended by its own Technical Advisory Group that applicants be required to demonstrate that ASR projects "not result in a net adverse impact to other senior water rights or to the environment," and has failed to articulate any alternative standard for review of project impacts and mitigation measures, as required by the legislature. The result appears to be an application process in which the Department exercises broad discretion in reviewing individual project applications unconstrained by substantive standards developed and articulated through the rulemaking process. This clearly was not the legislature's intent when it directed the Department to establish standards for review of ASR projects by rule. For this reason and the reason's indicated in Dr. Massmann's comments, we respectfully request that proposed rule be withdrawn and that the Department's Technical Advisory Group be reconvened to develop a proposed rule for public comment that contains the substantive standards for project review required by legislature and that protects senior water rights and the environment from adverse impacts. Sincerely, Richard Reich, Tribal Attorney.

Comment:

Judy Turpin, Washington Environmental Council

- Add the following language at the end of WAC 173-157-110 (4): "along with a plan to mitigate such conditions or impacts."
- WAC 173-157-160. Add after second sentence: "The mitigation plan shall prescribe actions to be taken to prevent adverse impacts to the environment and methods for evaluation of the effectiveness of these actions."
- Need to add a new WAC 173-157-170 (2)(e) as follows: (e) Data necessary to evaluate the effectiveness of required mitigation. (reletter present (e) to be (f).
- Edit WAC 173-157-200(3) as follows: The department may issue a conditioned permit to prevent any long term changes to the aquifer or other adverse impacts to the environment. The conditioning would provide for a pilot phase of the project, to be used to collect data, monitor efficacy, evaluate the effectiveness of any mitigation plan approved under WAC 173-157-160, and adjust the ASR project or mitigation plan based upon results.

Response: Thank you for your comments. The rule language will be amended for clarification to address your comments, per the recommendations provided by Judy Turpin. In the adopted rule, this will be WAC 173-157-200 (4).

Comment:

Alice Kaseberg, Bowie & Kaseberg

Every human being on Earth has a right to a life-supporting supply of clean water for personal use at an affordable price and if not affordable, free. Beyond that we can and must set priorities to use water wisely and keep it clean.

The use of underground aquifers for water storage raises at least two concerns: the issues surrounding privatization of water and the possible contamination of the aquifer itself, one of our remaining pristine sources of water.

First: Privatization of water: I don't need to remind you of the disaster of deregulation of electricity...corporate abuse...Enron, et al. We have witnessed all too well that the purpose of certain corporations is to make money for officers and boards of directors. Corporations are already buying up utilities for the express purpose of controlling water. Are these the people to whom we wish to entrust water?

The proposed use of aquifer storage opens the State of Washington to privatization of water supplies. We have already witnessed worldwide and local abuses or potential for abuse from corporations:

1. Bechtel, Inc. of San Francisco buys water rights in Bolivia in 2000. Results are so bad that 6 people die objecting to the changes in availability and cost of water for personal use. Bolivia rescinds the sale.*
2. Vivendi, a French corporation, attempts to buy water rights in Peru in June, 2002. The threat to affordable water for personal use results in rioting.*

We need water? Mandate conservation of water, restrict water consumption by individuals, government entities, and corporations. Enforce existing laws on pollution. Change plumbing design and codes to use gray water instead of fresh water in toilets. Do you know that Australians have two flush buttons on their toilets.. full flush and half flush? We have not begun to do a good job with existing water supplies.

Until we do more with what we have, it makes sense to keep water management under public control and to keep aquifers pure.

*Two very informative articles to support these statements:

Crisis on Tap? Science News , July 20, 2002, Vol 162, page 42

William Finnegan, Letter from Bolivia: Leasing the Rain, The New Yorker- April 8, 2002, page 43

Response: Thank you for your comments. Ecology acknowledges your concerns for potential abuse of ASR. The premise of ASR is not privatization of water but rather "general purpose." The Legislature recognizes the potential benefits of ASR. Ecology is adopting these rules as a means of achieving those benefits.

Comment:

Alice Kaseberg, Bowie & Kaseberg

Cadiz, Inc of Santa Monica is finalizing plans to obtain water from the Colorado River to store in an underground aquifer in the Mojave. The Colorado? The Colorado River has been “oversubscribed” for decades with the result that the Colorado River “flowing” into the Gulf of Mexico has been a muddy, contaminated trickle. How can a corporation supersede existing water users? Could this happen to the Yakima, the Snoqualmie, and even the Columbia Rivers?

Response: ASR projects cannot impair existing rights. RCW 90.03.010 states “...Subject to existing rights all waters within the state belong to the public, and any right thereto, or to the use thereof, shall be hereafter acquired only by appropriation for a beneficial use and in the manner provided and not otherwise; and, as between appropriations, the first in time shall be the first in right. Nothing contained in this chapter shall be construed to lessen, enlarge, or modify the existing rights of any riparian owner, or any existing right acquired by appropriation, or otherwise...”

Comment:

Alice Kaseberg, Bowie & Kaseberg

In Klickitat County, WA, farmland has been privately purchased solely for its water rights and the water “consolidated” to supply a natural gas power plant. This may ruin the well from which I draw water. Furthermore, how do I know that Yakima aquifer isn’t the source for my water?

Response: If the natural gas power plant you speak of is proposing an ASR project, this project cannot impair existing water rights, including yours. The permitting process for any ASR project provides opportunity for comment.

Comment:

Alice Kaseberg, Bowie & Kaseberg

For decades Northwest members of Congress have resisted efforts to build a water pipeline to California. Privately controlled water stored in aquifers will have fewer regulatory restrictions. How much easier will it be for private corporations to build water pipelines parallel to the natural gas lines and electric power lines already connecting the Northwest with California?

Response: Construction of water pipelines is beyond the scope of this rule. This rule does nothing to make the construction of water pipelines any easier for private corporations.

Comment:

Alice Kaseberg, Bowie & Kaseberg

Senate Bill 1961 is reported to require local water providers to sell equipment and control over water to corporations...or else lose federal funds for maintenance. Who is to stop corporate take over of ASR?

Response: We appreciate your concern. However, this bill is a federal bill not pertinent to ASR. Furthermore, this bill has yet to become law.

Comment:

Alice Kaseberg, Bowie & Kaseberg

Contamination of aquifer. How can we be sure that the water pumped into the aquifer will be “clean” in every respect?

1. Will the water be pumped in during “flood” stage?

The first systems to fail during flooding seasons are the sewage treatment plants. They are located near rivers and are often under the floodwater.

2. Will the water be pumped in during the heavy fall rains? This water cleans the streets and driveways and freeways...the summer accumulation of oil film to add to the aquifer!

3. Which rivers are suitably “clean” at any time to risk pumping them underground? How about the Columbia River when the radioactively contaminated groundwater from Hanford reaches its banks? Is this the “groundwater” quality standard you plan to enforce?

Response: We recognize the potential for the problems mentioned. To address these concerns, WAC 173-157-130(6) requires any water to be placed in an aquifer as part of an ASR project to be treated to the water quality standards set forth in Chapter 173-200 WAC.

Comment:

Alice Kaseberg, Bowie & Kaseberg

Aquifers do not respect state lines or even the national boundary with Canada. How can we sanely place water into an underground aquifer that may pass under other states or Canada? What about their laws? Their rights?

Response: A number of principles or customary rules tend to apply--these include an obligation not to do harm, the duty of equitable and reasonable use (like equitable apportionment between the states), the obligation of prior notification, and the duty to negotiate. The obligation not to do harm would probably include not approving an ASR project that might result in a degradation of water quality in a transboundary aquifer or perhaps subsidence on the other side of the border. Cooperation seems to be the preferred route among states and nations. Treaties and compacts are among the types of agreements pertaining to the use of our natural resources that we share with other states and countries.

PART I INTRODUCTION

Section – 010

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
Recommend adding “,when necessary,” before “to identify options for mitigation of potential adverse impacts...”

Response: We agree with your suggestion and the rule language has been amended as requested.

Section – 030

Comment: **John Bowman, Lakehaven Utility District**
In the first sentence after “or anyone else that intends to”, insert “obtain a reservoir permit to”.

Response: We agree with your suggestion and have incorporated your edit into the final rule language.

Comment: **Mark Gagnon and Tadd Giesbrecht, Brown and Caldwell**
The references throughout this section do not adequately refer to the allowable water quality of the injected water. An ASR well is considered a Class V injection well (per federal UIC regs), and under WAC 173-218 the State UIC code says that all new Class V wells injecting industrial, municipal and commercial waste fluids into or above a USDW are prohibited. Under the definition for waste fluids in 173-218 it could be construed that either AWT reclaimed water or treated water from a WTP could be considered waste fluids. Most of the ASR wells to date have used this type of water to inject for ASR wells. Possibly raw ground or surface water will not meet the anti-degradation standard. There is considerable latitude within the currently proposed regs to limit the type of water that can be injected. It would be more advantageous for them to set performance standards for the water allowed to be injected but not limit its source, so long as it meets the performance standards.

Response: We appreciate your concerns; however, we believe WAC 173-157-130 adequately addresses the water quality standards that must be met by the injected water. Section 173-200-040 WAC is very specific about the water quality criteria.

Section – 040

Comment: **John Bowman, Lakehaven Utility District**
Need definitions of “Reservoir Permit” and “Secondary Permit”.

Comment: **Cole Carter, Mark Gagnon, Tadd Geisbrecht; Brown and Caldwell**
More definitions are needed - nothing is included about the characteristics of the aquifer - ie defining confinement, etc. or how losses of water due to storage are going to be accounted for in the permitting process.

Response: We agree with your recommendations and have added definitions for the following terms: reservoir permit, secondary permit, confined aquifer, permeability, hydraulic continuity, transmissivity, hydrogeology, and vadose.

Losses of water due to storage are addressed in the feasibility study, and in the data monitoring plan defined in WAC 173-157-170(d).

Comment: **Martin Sebren, Kitsap Public Utility District**
Under the definition of 'Beneficial use', recommend adding "institutional" to the list of uses.

Response: RCW 90.54.020(1) defines beneficial uses and this rule cannot make changes to the statute. Institutions such as universities, hospitals, etc. fall easily under municipal, industrial, domestic, or a combination thereof.

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
Recommend replacing “in response” to “pursuant” under the definition of “UIC.”

Response: We agree with your recommendation and have edited the rule language accordingly.

Section – 050

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
How will changes to the amounts of water stored underground be addressed? Are additional secondary permits applied for if system increases/decreases or is it planned to phase out all secondary permits and include it in the beneficial use part of the water right permit?

Response: The reservoir permit will be issued for a maximum amount of water to be stored at any given time. Should the project request to store more than the permitted amount, a revised reservoir permit will be required. However, permitting the storage of a larger volume of water will be subject to the aquifer's ability to contain the additional increment of water proposed. Should the project choose to store less than the permitted amount, a new or revised secondary permit will not be required.

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
What if different uses for the water are identified - how is this handled as a permitting procedure?

Response: Uses for water is specified in the water right permit. Any changes to these approved uses will require a change to the water right, and a secondary permit to apply the water to a different beneficial use.

Comment: **Scott Goss, Manager, Roth Hill Engineering Partners, LLC**
Would utilities be able to monitor other users drawing from the same aquifer to make sure they were not taking the utility's stored water?

Response: Utilities have no authority within the rule to monitor other users. However, all users with access to the water within a given aquifer may enter into a private agreement that would establish this capability, and any party may bring a claim under the existing water code that another water user is impairing his or her rights.

Comment: **Scott Goss, Manager, Roth Hill Engineering Partners, LLC**
Who would be "the owners of the reservoir"? Would any property rights be associated with the reservoir? I am thinking of a large aquifer under a City.

Response: The language "owners of a reservoir" is part of the original 1917 water code. It was not until 2000 that RCW 90.03.370 was amended and the definition of "reservoir" came to include naturally occurring underground geological foundations where water is collected and stored as part of an ASR project. It is much easier to contemplate a property interest in a surface water reservoir than it is in an underground natural aquifer. For this reason, property rights in an underground aquifer would likely be limited to the use right in the water that is stored in the aquifer. To

distinguish a natural aquifer from a surface water reservoir, one does not simply construct an underground reservoir as it is defined in the statute. One must go through a complex set of steps (as indicated by the new WAC) to be able to store water in an underground reservoir. All waters of the state of Washington, including ground water, belong to the people of the state of Washington and are administered by DOE. For this reason, one would not have a property interest in an underground reservoir, but would have a usufructuary property interest in the water that that person or entity stores in the reservoir.

Section – 050(1)(a)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
Add the word “source” after “any” and before “water.”

Response: We agree with your recommendation and have edited the final rule language accordingly to provide clarification.

Comment: **Martin Sebren, Kitsap Public Utility District**
Section (1) (a) specifies that any water used must be obtained under a valid water right, therefore the provisions for a secondary permit in (1) (b) and (3) would seem to be unnecessary. If new uses are involved, a change to the original water right, not a new or secondary water right, would seem to be the appropriate course. It may also be helpful to add a clarifying note such as: "Because ASR is not the ultimate use of the water being stored, a change in the source water right is not required for the purpose of artificial injection. If the ultimate use of the water is different than that specified in the source water right, a change in the purpose of use is required."

Response: RCW 90.03.370(1)(a) requires a reservoir permit to store water, and a secondary permit to retrieve the water and apply it to beneficial use. The secondary permit gives the applicant permission to retrieve the stored water and apply it to the beneficial use specified in either a new or changed water right permit. RCW 90.03.370(1)(c) states “A secondary permit for the beneficial use of water shall not be required for use of water stored in a reservoir where the water right for the source of the stored water authorizes the beneficial use.” This eliminates the need for a two-step process when applying to store and recover water under a valid water right and applying the water to the beneficial use(s) stated therein.

Section – 050(1)(b)

Comment:

John Bowman, Lakehaven Utility District

“The underlying water right specifies the uses. Any changes to these uses will require issuance of a secondary permit.” It sounds like the secondary permit will modify the uses of the underlying water right? Is that the case?

Response: No, the secondary permit does not alter the underlying water right. The secondary permit gives the applicant permission to retrieve the stored water and apply it to the beneficial use specified in either a new or changed water right permit.

Comment:

Scott Goss, Manager, Roth Hill Engineering Partners, LLC

In a closed basin, would a changed water right for underground storage take precedence over other pending, but “on hold” claims? This project would essentially be providing its own water source that is in addition to the State’s existing groundwater resources.

Response: Any water for an ASR project must come from an existing and valid water right. Therefore, ASR projects are not a source of “new water” in closed basins that take precedence over pending applications for new water rights.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

Insert “authorized” before first instance of “uses.” Replace “changes to these” with “proposal to use stored water for different” uses will require issuance of a secondary permit.

Response: We agree with your recommendations and have edited the rule language accordingly to provide clarification.

Section – 050(2)

Comment:

Don Nichols, ERO/WQ

Who issues a “reservoir permit” and is this the lead SEPA agency for an ASR project?

Response: The Department of Ecology regional offices issue the reservoir permits. If the ASR project is federal or private, the department of Ecology is the lead SEPA agency. If the ASR project is local or state, the applicant will be lead.

Section – 050(3)

Comment:

Scott Goss, Manager, Roth Hill Engineering Partners, LLC

I am not clear on whether a new or revised water right would be required to withdraw the stored water from the reservoir. If a utility has rights for their wells and they pump the water underground in the winter, might they need to change their Qi to pump it out in the summer?

Response: A right to the source water is required in order to divert it for storage as part of an ASR project. If there is a change in the beneficial use to which the water will be applied, a revised water right and secondary permit are required.

Comment:

Scott Goss, Manager, Roth Hill Engineering Partners, LLC

If a new water right is required to withdraw the previously permitted well water back out of the underground reservoir, will other pending water right claimants have a “first shot” at this water, especially in a closed basin?

Comment:

Daniel Olson

In WAC173-157-050, section 3 requires a secondary permit if you plan to put the stored water to beneficial use, except in the case where the source water is permitted for the proposed beneficial use. My question is this: Why do you need this section? In this rule, you require a valid permit for the source water. Other sections require a permit for any water one proposes to put to beneficial use. So why add a requirement here, titled "secondary permit"? I can see the case where someone may want to store water taken under a valid permit and then want to use it for a different purpose or place (like perhaps the OASIS project), but wouldn't DOE require a separate permitting process for that right? Just asking, and wondering if you are adding an unnecessary section.

Response: ASR does not create a new water right. The reservoir permit issued to an ASR project is specifically for placing and storing water in an aquifer. Under RCW 90.03.370(1)(a), the secondary permit treats the aquifer as a source of water from which withdrawals are made and applied to a beneficial use. Any applicant already permitted to withdraw source water, and not changing the purpose of use, needs only the reservoir permit to provide for the temporary storage of the appropriated water. Any change to the type of beneficial use would constitute a change in

water right. The updated permit would consider the aquifer a secondary diversion point. Section 173-157-200(1) and RCW 90.03.370(1)(b) specifically state that “(t)he department shall expedite processing applications...” for storage projects that are “[a]dding or changing one or more purposes of use of stored water.”

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
Delete “of the stored” after “for the source,” and add “proposed” before “beneficial use.”

Response: We accept your recommendation and will edit the rule language accordingly for clarification.

Section – 050(4)

Comment: **Mary Shaleen-Hansen and Mike Hepp, WQ/HQ**
The construction and technical aspects of the injection wells must abide by UIC regulations as stated in 173-21. There isn't anything in 173-218 about construction. ASR wells should follow the minimum standards for construction and maintenance of wells, 173-160. Injection wells are excluded from this rule, 173-160-010 (c) (since shallow UIC wells may be dug with a backhoe or such). But ASR wells, so far, are deep, similar to water wells or are water wells used for injection.

Response: Reference to “chapter 173-218 WAC” will be corrected to read “chapter 173-160 WAC.”

PART II APPLICATION PROCESS

Section – 100

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
The requirements identified in terms of feasibility, monitoring and operation are all required under WAC 173-218-100 per the federal regs. Why is it necessary for this regulation to duplicate submittal of all that information? How would additional wells to an existing system be handled? Would a pilot study still be required? Could the existing system be modified to incorporate them?

Response: “WAC 173-281-100” was improperly referenced in the proposed rule language. The reference has been corrected to read “chapter 173-160 WAC.”

Section – 100(1)

Comment: **Don Nichols, ERO/WQ**
How does an applicant “...assess potential impacts...?” Is this via an engineering/HG report?

Response: Potential impacts can be assessed either conceptually or with a mathematical model. Specific knowledge of the geology, morphology, and hydrology of the project area is required to make a valid assessment.

Comment: **Don Nichols, ERO/WQ**
Regarding “...potential impacts...,” to the hydrogeologic system, does an ASR project have to show compliance with the ground water standards by being protective of background ground water conditions?

Response: An ASR project cannot degrade normal conditions in the project area. This includes background ground water conditions.

Comment: **Don Nichols, ERO/WQ**
What is a “...detailed feasibility study...” and what does it contain?

Response: A detailed feasibility study would include elements such as the ability of aquifer to receive additional water, the ability of aquifer to retain water for required period of time, evidence that no contamination of the aquifer will occur, no foreseen adverse impacts to surrounding area that cannot be fully mitigated, resource availability to support an ASR project, and cooperation from community involved.

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“This feasibility study should reduce uncertainty ~~on~~ of the impacts, and better quantify the available storage capacity within the aquifer.”

Response: We accept your recommendation with one additional edit. The rule language will be amended to read:

“This feasibility study should reduce uncertainty of the impacts, and better quantify the available storage capacity of the aquifer.”

Section – 100(2)

Comment:

Don Nichols, ERO/WQ

What % of a total ASR project is needed to be "...a pilot phase...?"

Response: Because each project varies in size and complexity, it would be difficult to assign a general percentage of total project time to the pilot phase. The purpose of the pilot phase is to verify the feasibility study, hydrogeologic system description, and environmental assessment; and validate the operation, mitigation, and monitoring plans. Therefore, the duration of the pilot phase will be dependent on time required to accomplish this and the nature and scope of the project.

Comment:

David Banton, Golder Associates

A pilot test is not defined and likely would be perceived differently by Agencies and by Owners. For example, a pilot test may be a short-term temporary test of recharge – several weeks. On the other hand, a pilot test might be considered as part of the first year of operations of an ASR system where additional information is collected to fine tune the operation of a system that is already well understood. Rather than specify a "pilot test" you may wish to consider language that requires the applicant to demonstrate through operations (for example one or two years), short-term testing or detailed analysis/modeling how a system is going to respond during recharge and develop an appropriate monitoring plan.

*Response: The subsection has been reworded as follows:
(2) To further reduce uncertainty, you must design a pilot phase for the project, to be used to collect data that will be used to validate the conceptual model, monitor efficacy, and adjust the monitoring, operation, and mitigation plans based upon results. The duration of this phase will be determined by the complexity of the project and stated within the reservoir permit.*

Section – 110

Comment:

Don Nichols, ERO/WQ

Has an application form been developed?

Response: The Department of Ecology has an appropriate form that can be utilized for ASR projects.

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
No requirement for formation testing, what it takes to justify how the system will operate.

Response: The rule specifies an application and permitting process that requires sufficient data within the hydrogeologic system description, and the operations and monitoring plans to verify how the system will and does operate.

Comment: **Anthony Moreland, Watershed Hydrologist, Squaxin Island Tribe**
Pertaining to the application requirements set forth in WAC 173-157-110, an application for an ASR project must also contain the following elements:

- A biological assessment and analysis of the potential adverse impacts to ESA listed and non-listed animal species and their associated habitats prepared by a qualified fish and wildlife professional;
- All feasibility and/or pilot study proposals must be submitted for review and approval before proceeding. An ASR application is not deemed complete until the pilot study is completed and submitted by the applicant.

Response: We appreciate your concerns and have amended WAC 173-157-110(4) to read “An environmental assessment and analysis (see WAC 173-157-150) of any potential adverse conditions or potential impacts to the surrounding ecosystem(s) that might result from the project, along with a plan to mitigate such conditions or impacts.” The following sentence has been added: “The environmental assessment will establish whether a determination of nonsignificance or an environmental impact statement is required per SEPA regulations.”

Section – 110(1)

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
Explain conceptual model - is this a description or an actual computer generated model? Clarification needed.

Response: The conceptual model is a general description of the project and the local hydrogeologic system based upon scientific expertise. The feasibility study and/or pilot phase will verify the system does operate according to the conceptual or mathematical model provided.

Comment:

Josh Baldi, Washington Environmental Council

In regard to WAC 173-157-110, we suggest omitting the word “general” before describing and referencing the section (WAC-1 57-120) that provides the detailed requirements for the hydrogeologic system description. The term “general description” implies a lack of specificity while the rule actually outlines fairly clearly the necessary contents of this document. This detailed documentation is essential for an adequate permit review by the department. As currently drafted, it could be argued that the rule is potentially internally inconsistent. Deleting the word “general” would appear to remedy this potential problem.

Response: We accept your recommendation and will delete the word “general” to remedy the potential problem. We will also reference the section as suggested.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“...prepared and certified by...”

Response: We accept your recommendation and the rule language will be amended accordingly for clarification.

Section – 110(2)

Comment:

Josh Baldi, Washington Environmental Council

Omit the word “general” before description and reference the section (WAC 173-157-130) that identifies the minimum requirements for this plan. (Same rationale as above)

Response: We accept your recommendation and will delete the word “general” to remedy the potential problem. We will also reference the section as suggested.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“...prepared and certified by...”

Response: We accept your recommendation and the rule language will be amended accordingly.

Section – 110(4)

Comment:

Don Nichols, ERO/WQ

Is the “...environmental assessment...” the same as an EIS?

Comment:

Part of my application must contain environmental assessment, but you do not state project must meet SEPA requirements.

Response: For clarification, the following sentence will be added: “The environmental assessment will establish whether a determination of nonsignificance or an environmental impact statement is required per SEPA regulations.”

Section – 120

Comment:

Don Nichols, ERO/WQ

Does the conceptual hydrogeologic model have to show that the proposed ASR project complies with the ground water standards?

Response: Not necessarily. However, compliance with the ground water quality standards must be confirmed before a project can proceed. WAC 173-157-130(6) requires that any water introduced into the aquifer must meet “the water quality standards set forth in chapter 173-200 WAC.”

Section – 120(1)(g)

Comment:

David Banton, Golder Associates

This item is too detailed for the rule. All water that is to be recharged contains dissolved constituents that could precipitate in the aquifer (if saturated) or in the vadose zone (if unsaturated) depending on the geochemical conditions. In addition to precipitation, there are other physical and geochemical changes of concern for ASR systems such as swelling of clays, dissolution of metals, etc. It would be more appropriate to state that the hydrogeological model describes:

(g) - “Potential for physio-chemical changes in the aquifer or vadose zone as a consequence of recharge.”

Response: We accept your recommendation. The subsection now reads: “(g) Potential for physio-chemical changes in the aquifer or vadose zone as a

consequence of recharge.” Additionally, a definition for “vadose zone” has been added.

Section – 120(2)

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
This subsection does not specify at what point in time the flow direction should be described (before the project or estimated with injection?).

Response: *This subsection refers to the naturally occurring direction for the aquifer and surrounding area which includes hydraulic connectivity to surface water bodies in the vicinity. WAC 173-157-120(3) requires the applicant to identify any anticipated changes to the naturally occurring flow due to the ASR project operations. It would be difficult to specify within this rule which project operation(s) may affect the naturally occurring flow given changes could occur during injection, recovery, seepage, etc.*

Section – 120(8)

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
This subsection does not define or justify what “the area affected by the project” means.

Response: *There is no determining factor that defines “the area affected by the project.” This will be defined based on geology, topography, etc. of the aquifer and surrounding area.*

Section – 120(9)

Comment: **John Bowman, Lakehaven Utility District**
Suggest moving this subsection to Section –130 and after subsection (4).

Response: *Thank you for your comment. However, we chose to leave the language in the current section as it is pertinent to the hydrology not the operation of the project.*

Comment: **Anthony Moreland, Watershed Hydrologist, Squaxin Island Tribe**
Pertaining to the requirements for an hydrogeologic system description set forth in WAC 173-157-120, paragraph (9), should be expanded as follows: Specific chemical and physical characteristics of the source water(s)

should be described and deemed compatible with the receiving aquifer formation and waters. For example, if surface waters are not allowed a “settling period” prior to injection, turbidity and total suspended solids may clog the interstitial pore spaces in the aquifer formation, and reduce its water holding capacity.

Response: We accept your recommendation and have edited the rule language as follows for clarification: “The chemical and physical composition of the source water(s) and their compatibility with the naturally occurring waters of the receiving aquifer.”

Section – 130

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
The project operation plan requirements have no provision for maintenance or rehabilitation of the ASR system.

Response: The purpose of this rule is to provide standards for review and mitigation of ASR project applications and operations. Maintenance and rehabilitation are the responsibilities of the applicant, so long as these activities are in accordance with the rule.

Section – 130 (1)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“...times of year source water...”

Response: We agree with your recommendation and will amend the rule language accordingly for clarification.

Section – 130(6)

Comment: **Ray Lam**
Add language for industrial water users (Non contact cooling water) to exempt them from meeting drinking water standards when retrieving the water. I agree that water being pumped in should meet the standard.

Response: The purpose of this subsection is to ensure that the ground waters of the state are protected from contamination. To do this, the department must be informed of any treatment planned for water that is discharged as part of an ASR project. Treatment to water drinking standards upon recovery may not be required depending upon the proposed use for the water, but any plan to treat or not to treat water upon recovery should be identified in the project plan.

Comment: **Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell**
This section could be seen as contradictory and extremely controversial depending upon the definition of public interest (not provided).

Comment: **Mary Shaleen-Hansen and Mike Hepp, WQ/HQ**
“The department shall give strong consideration to the overriding public interest in its evaluation of compliance with ground water quality protection standards.”

We want this sentence taken out of the rule because

- Overriding public interest (opi) is already part of the Ground Water Quality Standards (GWQS), 173-200-030(c)(i) and it doesn't need to be repeated in such a way as in the ASR rule.
- OPI has not been used to meet the GWQS, so this is uncharted territory.
- It may be misleading the public by stating "strong consideration"; opi may not work for all projects.

Also, this sentence doesn't belong under project operation plan. The proponent doesn't do opi, Ecology does.

Response: We appreciate your concern. However, while the concept of public interest is not readily subject to any given definition, the concept remains an important component of ASR. As such, we think it important to retain it in the rule; and this section is most appropriate.

Comment: **Anthony Moreland, Watershed Hydrologist, Squaxin Island Tribe**
Pertaining to the requirements for a project plan set forth in WAC 173-157-130(6), the following should be included:
“To be more specific, the ASR system design should include methods to mitigate any and all chemical and physical incompatibilities between the source water(s) and the receiving aquifer(s) waters.”

Response: We appreciate your comments. Please refer to subsections 110(6), 120(9), 170(2)(e), and 200(5) of this rule. We have made some edits to provide further clarification.

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“A description of ~~the~~ any water treatment method(s)…”

As phrased, rule suggests that treatment will always be required. Whether treatment is appropriate should be determined on a case by case basis.

Response: If the water being introduced or the project water already meets the water quality standards set forth in chapter 173-200 WAC, then treatment would not be required. The language will be edited as suggested to avoid misinterpretation.

Section – 130(7)

Comment: **David Banton, Golder Associates**

I would make it: “Any plans to discharge ASR water to a surface water body should include information on the quantity, duration, and means of discharge, and the water quality (physical, chemical, and bacteriological) of that discharge.”

Response: To respond to your concern and for clarification, the rule language has been amended to read: “(7) Any plans to discharge ASR water to a surface body should include information on the quantity, timing, duration, and water quality parameters such as chlorine, pH and dissolved oxygen of the ASR discharge water.”

Section – 130(8)

Comment: **Martin Sebren, Kitsap Public Utility District**

Recommend changing to read: "Operation and maintenance plans of the injection system to prevent clogging."

Comment: **David Banton, Golder Associates**

I suggest revising to: “Any plans to discharge groundwater and suspended sediment from the recharge well to surface water bodies shall provide information on the quantity, duration, quality and means of discharge.”

Response: To respond to your concern and for clarification, the rule language has been amended to read: “(8) Any operation and maintenance plans to discharge ground water and suspended sediment from the ASR well shall provide information on the quantity, duration, quality, and means of discharge.”

Section – 130(9)

Comment: **Mary Shaleen-Hansen and Mike Hepp, WQ/HQ**
NPDES permit needs to be listed as a possibility. Discharges to surface water must meet 173-201a to protect aquatic life by mitigating flow to prevent erosion and also contaminant levels. Has this been considered?

Response: To respond to your recommendation, a new subsection WAC 173-157-050(5) has been added, to wit: “(5) **NPDES permit.** Discharges to surface water must meet water quality standards set forth in chapter 173-201A WAC to protect aquatic life.”

Comment: **Mary Shaleen-Hansen and Mike Hepp, WQ/HQ**
Destination(s) for waste water. No definition of waste water is given. Second, change sentence to read “Destination(s) and permitting for waste water.”

Comment: **Cole Carter, Brown and Caldwell**
Waste water Class V UIC permits are prohibited per UIC regs. This needs to be adjusted. Also, if wastewater is reclaimed, this reg does not apply.

Response: We agree that any discharge of water to the surface must be done in accordance with WAC 173-201a. The term “waste water” here refers to that used to flush out the system, or held briefly prior to dispersal, etc. For clarification, the rule language will be adjusted to read: “(9) Destination(s) and permitting for water used for operation and maintenance (e.g., flushing water).”

Section – 140(1)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“...water rights ~~allowing use of~~ for the source waters...”

Issue is whether source water right is valid (i.e., perfected and not relinquished), not whether it authorizes storage.

Response: The language has been edited as suggested for clarification to avoid misinterpretation.

Section – 140(3)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“...or stream closures ~~in the vicinity of the point of diversion/withdrawal of the source water~~ within the ASR project area.”

Focus should be on effect of the entire project on other water rights, not just source water withdrawal. See also comments to Section – 200.

Response: We agree that your recommendation provides clarification. Rule language has been amended to read: “(3) Instream flows established by the department or stream closures in the vicinity of the point of diversion/withdrawal of the source water and/or within the ASR project area.”

Section – 150

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
Add new subsection (3) If an environmental assessment has already been performed for SEPA purposes, the application may simply refer to and need not repeat the analysis in the SEPA documentation.

Response: This statement adds clarification and we have therefore incorporated it, with amendments, so that the rule language now reads: “(3) If an environmental assessment has already been performed for the purposes of this specific ASR project, the application may simply refer to that documentation and need not repeat that analysis.”

Section – 150(1)(e)

Comment: **John Bowman, Lakehaven Utility District**
Suggest replacing the word “known” with “documented”. Also suggest deleting the “Seven-day” reference to low flows, since it may not be pertinent or documented in all cases.

Response: We agree that “documented” is more specific and thus preferable to “known”. Seven-day low flows are included because, in the past, these average flows were used to establish minimum instream flows to protect water quality.

Comment: **Martin Sebren, Kitsap Public Utility District**
Some reasonable limitation on the minimum size of the surface water bodies to be included needs to be specified.

Response: All surface waters within the ASR project area, no matter how small in volume, need to be monitored to ensure no detrimental changes to the volume occur during times of injection or withdrawal to or from an aquifer as part of an ASR project. Rather than setting a minimum, it is important to document historical and existing surface water data to establish monitoring requirements for the lifetime of the ASR project.

Section – 150(2)

Comment: **John Bowman, Lakehaven Utility District**
Suggest adding to the end of the sentence “, such as slope stability, ground deformation, or others.”

*Response: We agree that examples ensure the reader understands to which types of impacts we are referring. The subsection has been amended to read: “(2) Adverse impacts to the surrounding environment by the ASR project, including, but not limited to:
(a) Slope stability;
(b) Wetland habitat;
(c) Flood plain;
(d) Ground deformation;
(e) Surface water body or spring.”*

Comment: **Cole Carter, Brown and Caldwell**
This subsection does not clearly define “potential impacts to the surrounding environment.” This item needs to be defined and specific. Is the “surrounding environment” specific to groundwater or residents?

Response: Yes, these two items are not expressly defined because they will most likely be unique to each project. Examples of adverse impacts are included in

WAC 173-157-150(2). Essentially, any area above or below ground within the vicinity of an ASR project that may experience adverse impacts during project operations would be considered the “surrounding environment.”

Section – 160

Comment:

Don Nichols, ERO/HQ

Do Water Quality Program engineers have the expertise/guidance to review and approve project mitigation plans? Do the engineers know this additional workload is coming?

Response: This section requires the applicant to have mitigation plans reviewed and approved by an engineer, and thus creates no obligation on department employees.

Comment:

Cole Carter, Mark Gagnon, Tadd Giesbrecht; Brown and Caldwell

Why does project mitigation plan have to be reviewed and approved by an engineer specifically when it relates to environmental impacts? Suggest including “certified hydrogeologist” or “registered engineer or appropriately experienced and qualified professional.”

Response: An engineer familiar with geology and mitigation may not have the necessary experience or background to address all potential impacts to the physical environment; therefore, the rule requires review by an appropriately experienced engineer. The rule language has been amended to reflect this clarification.

Comment:

David Banton, Golder Associates

It seems to me that the term “adverse” needs to precede “impacts”. We should plan to mitigate for adverse impacts and not just potential impacts.

Response: We agree with your recommendation and the rule language has been amended accordingly.

Comment:

Dan Mathias, Utilities Engineer, City of Everett Public Works

Even very small ASR projects will likely have an effect on one or more of the five environmental features listed in WAC 173-157-160. The effect could be detrimental or beneficial. It is not practical to suggest that all potential impacts are completely mitigated for all projects. I suggest changing this section to read “...shall address all potential impacts to the

environment, such as...”

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

I recommend the rule language be amended to read: “Your project mitigation plan, ~~which~~ if necessary, must be ~~reviewed and approved~~ prepared by an engineer licensed in the state of Washington, and shall include actions adequate to mitigate for any identified potential adverse impacts to the environment, such as:”

Response:

The department’s concern is the quality of the report. The applicant will be required to fully mitigate any adverse impacts. Any impact deemed beneficial will be monitored per recommendations set forth in the permit. The rule language has been amended as follows: “Your project mitigation plan, if necessary, must be reviewed and approved or prepared by an appropriately experienced engineer licensed in the state of Washington. The mitigation plan shall prescribe actions to be taken to prevent adverse impacts to the environment and methods for evaluation of the effectiveness of these actions.”

Section – 170(title)

Comment:

John Bowman, Lakehaven Utility District

In the Title and first sentence, replace the word “data” with “project”, as was done in section –110(6)

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“What must I include in the ~~data~~ project monitoring plan?”

Response:

We agree with your recommendation and have modified the rule language accordingly.

Section – 170(2)(c)

Comment:

Martin Sebren, Kitsap Public Utility District

Should under or over-laying aquifers be addressed?

Response:

This subsection does not specifically address under or overlying aquifers. These would be addressed in the environmental assessment (see WAC 173-157-150).

Section – 170(2)(d)

Comment: **Dan Mathias, Utilities Engineer, City of Everett Public Works**
The intent of (d) is unclear. What is the initial amount of stored water? Can the varying lengths of time be defined? “Recoverable” should be defined. Presumably, the conceptual model will estimate the average annual volume of recharged water that can be subsequently withdrawn from the aquifer and pilot plant results can be used to calibrate or refine the conceptual model estimate. Is this what (d) is trying to say?

Response: The amount of stored water is that which has been added to and retained by the aquifer via injection or surface spreading and infiltration. The length of storage can vary from a matter of days to years depending on when the stored water is recovered. Your presumption is correct; the purpose of the model is to predict the amount of water available for recovery, then the pilot phase will be utilized to either validate or adjust these predictions. Any adjustments will be reflected in the project operation and monitoring plans.

Section – 170(end)

Comment: **David Banton, Golder Associates**
The rule requires annual monitoring reporting. It is my opinion that annual monitoring reporting for the first few years is acceptable as information is gathered on the performance of the system, but after a three or five year period, then reporting every three or five years is more reasonable.

Comment: **John Bowman, Lakehaven Utility District**
Suggest the applicant also propose a duration for monitoring the aspects of the project. While some monitoring may go on for the entire operating life of the project, other aspects of the monitoring program that are checking for impacts, or extra pilot testing for verification, should have a limited life to the monitoring requirement.

Response: The required duration and frequency for monitoring and reporting of the data will be stipulated within the reservoir permit and based upon the complexity of the ASR project. Monitoring remains valuable throughout the lifetime of the project. It is possible that the frequency will decrease after the pilot phase. Every project will be fact specific and the terms will be specified in the reservoir permit.

Comment: **John Bowman, Lakehaven Utility District**
Last sentence of the last paragraph, suggest inserting the word “reservoir” in front of the word “permit”, for clarity.

Response: We agree with your recommendation and have added the word “reservoir” for clarification.

PART III APPLICATION REVIEW PROCESS

Comment: **Mark Gagnon and Tadd Giesbrecht, Brown and Caldwell**
The Administration rules appear to be written differently than other WAC codes. To be consistent with other WAC codes, it seems that the Administration rules should be written using terms “the department” and “the applicant” rather than “you” and “I”.

Response: Yes, this rule is written differently than other existing Ecology regulations. By using the terms “you” and “I”, rather than “the applicant”, it is our intent to make the document clearer and easier for the reader to use. Personal pronouns are familiar to writers and readers alike since we all use them in conversation and correspondence. Many people feel that using “you” and “I” helps the reader understand the content better and enables the writer to find problems in the rule language that would otherwise interfere with implementation.

Section – 200(1)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“in accordance with the provisions and standards of RCW 90.03.250...”

Response: We appreciate your comment. However, by reviewing applications under the provisions of RCW 90.03.250 through RCW 90.03.320, it is necessarily implied that the review will be performed under the standards contained therein.

Section – 200(1)(b)

Comment: **Dan Mathias, Utilities Engineer, City of Everett Public Works**
“Expedite” should be defined. Is the Department committing to completing the permit process within a specified time?

Comment: **Martin Sebren, Kitsap Public Utility District**
Why should ASR projects that include a change in purpose of use receive priority processing?

Response: This language is directly from RCW 90.03.370(1)(b). Expedite is not explicitly defined in the statute. However, expedite has been interpreted to mean that these applications are in a “separate line” from all other water right and change applications submitted to the department. The department is not committing to process ASR project applications within a specified period of time but rather to give these applications priority, as the legislature has directed.

Section – 200(1)(c)

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
“...storage capacity of ~~the~~ an existing reservoir;...” Tracks statute.

Response: We agree and have added the suggested amendment to the rule language.

Section – 200(1)(d)

Comment: **Martin Sebren, Kitsap Public Utility District**
Why would such applications get primary processing?

Response: This language was taken from RCW 90.03.370. The legislature recognizes the importance of promoting new and innovative methods of water storage.

Comment: **Matthew D. Wells, Preston|Gates|Ellis LLP**
I recommend editing the rule language to read: “...water stored in ~~the~~ an existing reservoir.” Tracks statute.

Response: We agree and have added the suggested amendment to the rule language.

Section – 200(2)

Comment: **John Bowman, Lakehaven Utility District**
Not all projects will impact surface waters. Suggest adding “that may impact surface waters” after the words “...under this chapter”.

Also, it is stated that the WDFW should ensure that no alteration of natural flow peaks occur during or after project diversions or withdrawals. Their review should be limited to the impacts of the injection and withdrawal from the reservoir operations, not the diversion from the permitted water rights.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“...specifically to consider whether ~~ensure that~~ the following ~~do not~~ may occur during or after the ASR project diversion or withdrawals...”

*Response: The rule language has been moved to subsection (3) and was amended as follows:
“Any application considered under this chapter that may impact surface waters will be subject to review by the department, WDFW, DOH, and the appropriate Indian tribe(s), specifically to ensure that the following do not occur during ASR project injections or withdrawals:...”*

Comment:

Tom Clingman, Thurston County Department of Water and Waste Management

What is a "WDFW water rights biologist?" Seems like an interesting job title.

Response: Technically, a WDFW water rights biologist is assigned to review water rights and change applications for their impact to fish and wildlife.

Comment:

Dan Mathias, Utilities Engineer, City of Everett Public Works

Review by a Washington Dept. of Fish and Wildlife (WDFW) biologist should not be required for all projects. How can the Department expedite projects if a separate review by another state department is required? Instead, review by a WDFW biologist should only be required for projects that are likely to adversely affect fisheries resources. Most ASR projects will require acquisition of a Hydraulic Project Approval (HPA) by WDFW. Issuance of an HPA by WDFW should satisfy the requirements of WAC 173-157-200(2).

Response: WDFW will review ASR projects similarly to the present process for water rights applications to ascertain any potential adverse impacts to fish or wildlife, and if mitigation is possible. The director of WDFW has thirty days after receiving the notice from Ecology to state his or her objections to the ASR project application (RCW 77.55.050).

It should not be assumed that WDFW will have Hydraulic Code jurisdiction over aquifer storage facilities. There is some question whether aquifer storage would be defined as "the construction of a hydraulic project", or "work" per RCW 77.55.100. Recent changes in WDFW jurisdiction over underground stormwater projects further diminish our authority over such projects. Thus, WDFW's ability to comment on storage projects is justified and should be preserved.

Section – 200(2)(a)

Comment:

John Bowman, Lakehaven Utility District

Subsection 2(a) would suggest that WDFW should ensure that there is no alteration of the natural flow peaks, which is when winter water is most available? Suggest revising Subsection (2)(a) to “Detrimental changes in stream flows.”

Comment:

Richard Price, Stevens County P.U.D.

Reducing natural flow peak should usually be beneficial for flood control, etc. - this condition seems unreasonable.

Comment:

Art Schick, Suquamish

The concept that there is "extra" water available as high winter flows is flawed. High winter flows are part of nature's ecological flow regime, and are necessary to transport nutrients and purge fine sediments that would smother spawning gravel. Natural hydrology is already significantly altered. Further shifting of seasonal flows on fish-bearing streams is likely to be in conflict with ecosystem restoration objectives.

Comment:

David Banton, Golder Associates

Goes on to say that any application will be reviewed to ensure that the following do not occur – and lists “Erasure or alteration of natural peak flows”.

Any new diversion will affect flows in surface water and hence alter peak flows. Therefore, would all new applications be denied? This is not the purpose of the rule. Therefore, this section needs clarification. I suggest:

“Modification of existing conditions that adversely impact instream resources.”

Comment:

Anthony Moreland, Watershed Hydrologist, Squaxin Island Tribe

The rule proposes to inject surface water runoff during winter high flow periods into designated aquifer zones by way of an injection well(s). This requires pumping surface water from a water body sufficient in size and volume to support such an effort. Other than a few lakes scattered throughout Thurston County, the only surface water catchments that fit such a requirement are the rivers and creeks themselves. While the impact

of pumping and diverting surface water from these water bodies during the high flow period is reduced, it is not eliminated. High flows are a necessary stream flow dynamic which provides essential rearing habitat for salmonids and other anadromous fish species. A diversion in the high flow runoff within a basin drainage can seriously alter stream dynamics resulting in reductions of large woody debris placement, reductions in sediment deposition, and losses of off-channel and side-channel rearing habitat, just a few of the many factors which are important for fish habitat.

Comment:

Perry Harvester, WDFW

With regard to "2 a" , there may be other stages of the hydrograph, in addition to peak flows, that we may be concerned with which could be affected by Aquifer storage and recovery. I therefore recommend the following edits:

(a) erasure or alteration of the normative hydrograph which may result in adverse impacts to fish ~~life natural flow peaks;~~

Response:

WDFW and the appropriate Indian tribe(s) will be provided opportunity to determine and comment when a project "may impact surface waters," and when alterations of flow are detrimental to fish life. Dampening of the range of natural flows is a concern because natural flow peaks provide important life-cycle cues, protect water quality when riparian vegetation sequesters flood-borne pollutants, prevent species dominance, and are critical for maintaining riparian and aquatic habitat integrity and biodiversity. There is no question that flood flows have proven very important in maintaining critical habitat functions relevant to fish survival and productivity, and a properly functioning riverine ecosystem.

The amended rule language now reads "(3) Any application considered under this chapter that may impact surface waters will be subject to review by the department, WDFW, DOH, and the appropriate Indian tribe(s), specifically to ensure that the following do not occur during ASR project injections or withdrawals:

(a) Alteration of the normative hydrograph which may result in adverse impacts to fish;

Section – 200(2)(b)

Comment:

Perry Harvester, WDFW

With regard to "2b", there may be other deleterious materials other than nutrients and temperatures which may affect fish life. If displacement of other deleterious materials occurs as a result of aquifer storage, adverse effects could occur. I therefore recommend the following edits:

(b) detrimental changes in temperature, ~~and~~ nutrient, heavy metals, hydrocarbon or other deleterious material levels during critical spawning and rearing periods;

Response: The recommended changes provide clarification and have been incorporated into the rule language.

Section – 200(2)(c)

Comment:

Dr. Robert L. Vadas, Jr., Instream Flow Biologist, WDFW

Down- & upwelling (groundwater seepage) are critical components of alluvial, floodplain streams that salmonids, amphibians, & aquatic invertebrates use for spawning, incubation, & rearing (Williams 1984; Stanford and Ward 1988; Cavallo 1997; Hayes et al. 2002). Here's a relevant quote from my Irely Cr. research-update report to NPS:

“In any case, our data support literature findings that Pacific Northwest cutthroat generally spawn in pool-tailouts near riffles (Blakley et al. 2000), i.e., upward-sloping areas that promote downwelling (intragravel flow) that is generally important for Pacific-salmonid spawning (Carl et al. 1967; Steelquist 1992; Geist and Dauble 1998).”

Hence, down- & upwelling should indeed occur during ASR processes, the latter of which shouldn't disturb the natural hyporheic-flow regime. The WDOE statement as written is confusing.

Response: We agree with your recommendation and have amended the language as follows: “Disruption of natural downwelling and upwelling within stream during critical spawning and rearing periods”

Section – 200(2) Ending sentence

Comment:

Martin Sebren, Kitsap Public Utility District

Are biologist comments the only consideration associated with public welfare?

Comment:

Anthony Moreland, Watershed Hydrologist, Squaxin Island Tribe

Pertaining to the ASR permit requirements set forth in WAC 173-157-200, a statement should be included that requires review and approval of all ASR applications by affected Tribal governments prior to application approval and issuance of an ASR permit. In addition, a statement should be included that solicits public review and comment on each ASR application prior to issuing an ASR permit.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“The department will consider any comments by the water rights biologist in ~~determining whether the project will be detrimental to public welfare~~ evaluating the application.”

Where applicant has a valid source water right (i.e., perfected and not relinquished) and proposed diversions/withdrawals of source water will be within the measure of that valid source water right, department has very limited authority, if any, to condition applicant’s lawful exercise of the source water right in the manner suggested by subsection (2) as drafted. Subsection (2) should therefore be deleted in its entirety, or, if retained, modified as noted above. If reference to the public welfare test of 90.03.290 is retained, rule should clarify that the test applies only to use and operation of the reservoir – not to use of valid source water rights that is within the measure of such rights (i.e, Qa, Qi, season and point of withdrawal/diversion.

Response: All interested parties will have the opportunity to comment per RCW 90.03.280. This subsection is now WAC 173-157-200(3) and has been amended to read: “Each ASR project application will be subject to public notice and comment per RCW 90.03.280. The department will consider any comments by the reviewers in evaluating the application.”

Section – 200(3)

Comment:

Richard Price, Stevens County P.U.D.

Aquifer recharge could have beneficial effects on groundwater quality - to not allow any changes seems unrealistic and unreasonable.

Response: ASR and aquifer recharge are not the same process. This section refers specifically to conditions on a permit. It is true that aquifer recharge could have beneficial effects on groundwater quality, such as where seawater intrusion into the aquifer occurs.

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“...Such conditioning ~~would~~ will provide for...”

“...and adjust the plan based upon pilot phase results.”

Response: We agree with your suggested edits and have incorporated them into the rule language as WAC 173-157-200 (4).

Section – 200(6)

Comment:

Matthew D. Wells, Preston|Gates|Ellis LLP

“...to verify that the project is ~~indeed viable~~ has been implemented.”

“...the department will issue certificates for the reservoir and secondary permit, ~~if any, certificates~~ with the priority date or dates based on the underlying source ~~or sources~~ of water right.”

Issue for certification of permitted uses is whether the right has been perfected – i.e., whether the project has been implemented – project “viability” is for applicant to determine and is irrelevant to department’s consideration in context of request for certification.

Response: We agree with your comments and the rule language, now WAC 173-157-200 (7), has been amended to read: “Once sufficient information is developed and provided to the department to verify that the project is viable and the requirements of RCW 90.03.330 have been met, the department will issue proper documentation for the reservoir and secondary permit, if any, with the priority date or dates based on the underlying source water right.”

Section – 230

Comment:

Mary Shaleen-Hansen and Mike Hepp, WQ/HQ

Website addresses change. Take out the addresses for Ecology and the pollution control board site.

Response: These particular website addresses aren’t likely to change in the near future. Therefore, to ensure access, the information will remain in this section. Should the website addresses change, the rule can be amended to reflect these changes.

IV Summary of public involvement opportunities

A technical advisory group representing tribes, environmental interests, municipalities, consultants, and Ecology staff developed the initial draft of the rule and provided comments.

A focus sheet was prepared and sent out in June 2002 to 1500 interested parties announcing the proposed rule. The focus sheet also announced the posting of the proposed rule on the agency website for public review and informal comments.

A news release was issued on August 7, 2002 announcing the upcoming open house/public hearings and soliciting comments on the proposed rule language. The Water Resources Program

solicited both written comments and oral testimony. The notice of the proposed rule was filed with the Code Reviser on July 24, 2002 and published in the State Register on August 7, 2002. A comment period and hearing notice on the proposed rule making announced via mail and email to about 1500 interested persons. The comment period extended from August 7 to September 16, 2002.

The Water Resources Program conducted three public open house/hearings on the proposed rule, *Underground Artificial Storage and Recovery, Chapter 173-157 WAC*. Following are the dates, places, and numbers in attendance:

8/27/02	Kennewick Mid Columbia Kennewick Library	Attendance: 11
8/28/02	Federal Way Lakehaven Center	Attendance: 21
8/29/02	Federal Way Lakehaven Center	Attendance: 0

Ecology staff present included Doug McChesney, policy section manager, Kathleen Enseñat, rule writer, and Christine Corrigan, hearings officer.

Summary:

The open house format was particularly suited to this highly technical rule and resulted in lively discussion among participants. Representatives from cities and public water districts with aquifer storage and recovery (ASR) projects or project proposals were present, in addition to Ecology staff, to provide information on and answer questions about ASR.

No recorded testimony was received at the above hearings. Several people took the opportunity to provide written comments at the hearing using available paper forms or a laptop computer.

The hearing on August 29 was the result of a discrepancy between the date published in the Washington State Register, August 29 according to the CR102, and August 28, the date arranged for the second open house but not changed on the CR-102.

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VI Appendices

A. Washington State Register Notice of Proposed Rule

WSR 02-15-181
PROPOSED RULES
DEPARTMENT OF ECOLOGY

[Order 02-06 -- Filed July 24, 2002, 11:18 a.m.]

Original Notice.

Preproposal statement of inquiry was filed as WSR 02-08-073.

Title of Rule: Chapter 173-157 WAC, Underground artificial storage and recovery.

Purpose: The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and standards for identification and mitigation of potential adverse impacts to ground water quality or the environment.

Statutory Authority for Adoption: RCW 90.03.370 (2)(b), 90.44.460.

Statute Being Implemented: RCW 90.03.370, chapter 90.44 RCW.

Summary: Chapter 173-157 WAC outlines the process the Department of Ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Name of Agency Personnel Responsible for Drafting: Kathleen Ensenat, Department of Ecology, Headquarters, (360) 407-6780; Implementation and Enforcement: Joe Stohr, Program Manager, Department of Ecology, Headquarters, (360) 407-6602.

Name of Proponent: Department of Ecology, governmental.

Agency Comments or Recommendations, if any, as to Statutory Language, Implementation, Enforcement, and Fiscal Matters: This will create a "third line" for processing permits for applicants that already hold a right to the source water.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and, standards for identification and mitigation of potential adverse impacts to ground water quality or the environment. Chapter 173-157 WAC outlines the process the Department of Ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Under this proposal, an application for a reservoir permit for an ASR project must contain, at a minimum:

(1) A general description (conceptual model) of the hydrogeologic system prepared and certified by a hydrogeologist licensed in the state of Washington.

(2) A project operation plan with a general description of the pilot and operational phases of the ASR project prepared and certified by an engineer or geologist licensed in the state of Washington.

(3) A description of the legal framework for the proposed project.

(4) An environmental assessment and analysis of any potential adverse conditions or potential impacts to the surrounding environment that might result from the project.

(5) A project mitigation plan, if required.

(6) A project monitoring plan.

Proposal does not change existing rules.

No small business economic impact statement has been prepared under chapter 19.85 RCW. A small business economic impact statement is not required because the substantive requirements for obtaining an ASR permit are mandated by RCW 90.03.370 (2)(a). Furthermore, those requirements are essential to prevent infringement on existing water rights and environmental damage from improper ASR design or operation.

RCW 34.05.328 applies to this rule adoption. It has been determined that this rule would be considered a significant legislative rule. Therefore, the requirements of RCW 34.05.328 are being met.

Hearing Location: Mid Columbia Kennewick Library, 1620 South Union, Kennewick, 99336, on August 27, 2002, at 5:00 p.m.; and at Lakehaven Center, 31531 1st Avenue South, Federal Way, 98003, on August 29, 2002, at 5:00 p.m.

Assistance for Persons with Disabilities: Contact Christine Corrigan by 5:00 p.m. on August 20, 2002, TDD (360) 407-6006 or (360) 407-6607.

Submit Written Comments to: Kathleen Ensenat, 600 Desmond Drive, Lacey, WA 98504, Kspa461@ecy.wa.gov, phone (360) 407-6780, fax (360) 407-7162, comments must be received by 5:00 p.m. on September 6, 2002.

Date of Intended Adoption: November 9, 2002.

July 23, 2002

Linda Hoffman

Assistant Director

Chapter 173-157 WAC

UNDERGROUND ARTIFICIAL STORAGE AND RECOVERY

PART I INTRODUCTION

NEW SECTION

WAC 173-157-010 What is the purpose of this rule? The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and to identify options for mitigation of potential adverse impacts to ground water quality or the environment. The rule also outlines the process the department of ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

□

NEW SECTION

WAC 173-157-020 What is the authority for this rule? In 2000, the Washington state legislature passed Engrossed Second Substitute House Bill 2867 (E2SHB 2867), which amended chapters 90.03 and 90.44 RCW. This bill expanded the definition of "reservoir" in RCW 90.03.370 to include "any naturally occurring underground geological formation where water is collected and stored for subsequent use as part of an underground artificial storage and recovery project." Projects of this type are more commonly known as "aquifer storage and recovery" or "ASR" projects. The legislation directed the department to adopt rules establishing the "standards for review and standards for mitigation of adverse impacts for an underground artificial storage and recovery project." The department of ecology promulgates this rule under the authorities provided in chapter 34.05 RCW and RCW 90.03.370.

□

NEW SECTION

WAC 173-157-030 To whom does this rule apply? This rule applies to any firm, association, water users' association, corporation, irrigation district, or municipal corporation, or anyone else that intends to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370. This chapter does not apply to projects utilizing irrigation return flow, or to operational and seepage losses that occur during the irrigation of land, or to water that is artificially stored due to the construction, operation, or maintenance of an irrigation district project, or to projects involving water reclaimed in accordance with chapter 90.46 RCW.

□

NEW SECTION

WAC 173-157-040 What are the meanings of words and phrases used in this rule? "Aquifer storage and recovery project," "ASR project," or "underground artificial storage and recovery project" means those projects where the intent is to artificially store water in an underground geological formation through injection, surface

spreading and infiltration, or other department-approved method, and to make subsequent use of the stored water.

"Artificial recharge" means either controlled subsurface addition of water directly to the aquifer or controlled application of water to the ground surface for the purpose of replenishing the aquifer.

"Beneficial use" includes, among others, uses for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, thermal power production, municipal, and preservation of environmental and aesthetic values.

"Department" means the Washington department of ecology.

"DOH" means the Washington department of health.

"Piezometric elevation" means the static level to which the water from a given aquifer will rise under its full head.

"RCW" means the Revised Code of Washington.

"Receiving aquifer" or **"reservoir"** means any portion of a naturally occurring underground geological formation in which the source water will be collected and stored for a future beneficial use as part of an ASR project.

"SEPA" means the State Environmental Policy Act, chapter 43.21C RCW.

"Source water" means water that will be stored in a receiving aquifer.

"Stored water" means water that has been stored in a receiving aquifer pursuant to a reservoir permit issued in accordance with the provisions of this chapter.

"UIC" means the Underground Injection Control program, which was created by the U.S. Environmental Protection Agency in response to federal legislation (the Safe Drinking Water Act) and is administered by the department's water quality program.

"You" and **"I"** means any firm, association, water users' association, corporation, irrigation district, municipal corporation, or anyone else that intends to obtain a reservoir permit to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370.

□

NEW SECTION

WAC 173-157-050 What authorization is required for an ASR project? The following permits or authorizations are required:

(1) Water rights to source waters.

(a) Any water you use as part of a project by diverting from a state watercourse or withdrawing state ground waters, must be obtained under a valid water right permit, certificate, or registered water right claim.

(b) The underlying water right specifies uses. Any changes to these uses will require issuance of a secondary permit.

(2) **Reservoir permit.** When proposing to collect and store water in a naturally occurring underground geological formation for subsequent use as part of an ASR project, you must apply for a reservoir permit in accordance with the provisions of RCW 90.03.370 (2)(a).

(3) **Secondary permit.** You must apply for a secondary permit in accordance with the provisions of RCW 90.03.370 if you propose to apply the water stored in a reservoir to a beneficial use, except that you are not required to apply for a secondary permit if you already have a water right for the source of the stored water that authorizes the beneficial use.

(4) **UIC registration.** All UIC wells to be utilized as part of an ASR project must be registered with the department in accordance with the provisions of chapter 90.48 RCW. Additionally, the construction and technical aspects of the injection wells must abide by UIC regulations as stated in chapter 173-218 WAC.

□

PART II APPLICATION PROCESS

NEW SECTION

WAC 173-157-100 What should I know before I apply? (1) You must assess potential impacts to the hydrogeologic system and the environment prior to submitting your application. If your application does not describe the general setting and conditions with sufficient information for the department to assess the application, the department may require you to perform a detailed feasibility study. This feasibility study should reduce uncertainty on the impacts, and better quantify the available storage within the aquifer.

(2) To further reduce uncertainty, you must design a pilot phase of the project, to be used to collect data, monitor efficacy, and adjust the plan based upon results.

(3) You may schedule a preapplication meeting with the department to discuss the project plan and likely requirements for monitoring and mitigation.

□

NEW SECTION

WAC 173-157-110 What types of information will I need to provide as part of my application? Your application for an ASR project must contain, at a minimum:

(1) A general description (conceptual model) of the hydrogeologic system prepared and certified by a hydrogeologist licensed in the state of Washington.

(2) A project operation plan with a general description of the pilot and operational phases of the ASR project prepared and certified by an engineer or geologist licensed in the state of Washington.

(3) A description of the legal framework for the proposed project.

(4) An environmental assessment and analysis of any potential adverse conditions or potential impacts to the surrounding environment that might result from the project.

(5) A project mitigation plan, if required.

(6) A project monitoring plan.

□

NEW SECTION

WAC 173-157-120 What must I include in the hydrogeologic system description? Your hydrogeologic system description must include a conceptual hydrogeologic model that describes:

(1) The aquifer targeted for storage, to include at a minimum estimates for:

(a) Lateral and vertical extent;

(b) Whether the aquifer is confined or unconfined;

(c) Permeability;

(d) Total storage volume available;

(e) Effective hydraulic conductivity;

(f) Transmissivity; and

(g) Potential for introduction of precipitates into the ground water when normally dry formation is recharged.

(2) The estimated flow direction(s) and rate of movement.

(3) The anticipated changes to the ground water system due to the proposed ASR project.

(4) The estimated area that could be affected by the project.

(5) The general geology in the vicinity of the proposed project, including stratigraphy and structure.

(6) The locations of existing documented natural hazards that could be affected or exacerbated by the project, such as landslide-prone areas or areas of subsidence.

(7) The locations of surface waters such as springs, creeks, streams or rivers that could be affected by the ASR project.

(8) The locations of all wells or other sources of ground water of record within the area affected by the project.

(9) The chemical composition of the source water and its compatibility with the naturally occurring waters of the receiving aquifer.

□

NEW SECTION

WAC 173-157-130 What must I include in the project operation plan? Your project operation plan should include, at a minimum, the following information:

- (1) The quantity and times of year water is available for recharge.
- (2) The proposed rate of injection and withdrawal of water.
- (3) The length of time the water is proposed to be stored.
- (4) The location, number, and capacity of proposed recharge wells or infiltration basins, and recovery facilities.
- (5) Any variability in quality and reliability of the source water.
- (6) A description of the water treatment method(s) you will use at the time of injection and recovery to ensure compliance with the water quality standards set forth in chapter 173-200 WAC, as well as the department's antidegradation policy. The department shall give strong consideration to the overriding public interest in its evaluation of compliance with ground water quality protection standards.
- (7) Any plans to aerate, if required, when pumping water out of an aquifer for stream augmentation.
- (8) Any plans to flush out the injection system to dislodge sediment which can cause clogging.
- (9) Destination(s) for waste water.

□

NEW SECTION

WAC 173-157-140 What must I include in the description of the legal framework? Your description of the legal framework should include, at a minimum:

- (1) Documentation of the water rights allowing use of the source waters intended to be stored for the proposed ASR project.
- (2) A list of other water rights within the ASR project area.
- (3) Instream flows established by the department or stream closures in the vicinity of the point of diversion/withdrawal of the source water.
- (4) Ownership and control of any facilities to be used for the proposed project.

□

NEW SECTION

WAC 173-157-150 What must I include in the environmental assessment and analysis? Your environmental assessment and analysis must, at a minimum, describe:

- (1) The environment within the ASR project area, including:

- (a) Proximity to contaminated areas;
- (b) Present and prior land use(s) within the ASR project area;
- (c) Location(s) of historical or existing wetland habitat(s);
- (d) Location(s) of historical or existing flood plain(s);
- (e) Location(s) of historical or existing surface water body or spring, including known:
 - (i) Base flows;
 - (ii) Seven-day low flows;
 - (iii) Maximum flows;
- (2) Potential impacts to the surrounding environment by the ASR project.

□

NEW SECTION

WAC 173-157-160 What must I include in the project mitigation plan? Your project mitigation plan, which must be reviewed and approved by an engineer licensed in the state of Washington, shall include actions adequate to mitigate for any identified potential impacts to the environment, such as:

- (1) Slope stability;
- (2) Wetland habitat;
- (3) Flood plain;
- (4) Ground deformation;
- (5) Surface water body or spring.

□

NEW SECTION

WAC 173-157-170 What must I include in the data monitoring plan? Your data monitoring plan, which will be utilized to evaluate and verify the assumptions in the conceptual model, during the pilot and operational phases, must include the following:

- (1) Proposed time intervals for sampling and subsequent reporting.
- (2) Descriptions of measurement methodology, threshold values, and evaluation techniques for the following criteria:
 - (a) The quality of the source and receiving waters. This information must be provided for the period or periods of the year when the water will be stored. Testing must be done by a laboratory certified by either the department or DOH.
 - (b) The actual quantity of water injected.

(c) Changes in ground water piezometric elevations in the receiving aquifer.

(d) The percentage of the initial amount of stored water that is recoverable after varying lengths of storage time to validate the estimates of the amount of stored water that is actually recovered.

(e) Other data you or the department deem important for monitoring the ASR project and potential impacts.

You must provide a report of the monitoring data, at least annually, to the department. Based on the complexity of the project, the department may require you to comply with a more frequent reporting schedule. The required reporting frequency will be documented in the permit.

□

NEW SECTION

WAC 173-157-180 Where do I submit my application for a reservoir and/or secondary permit? You must submit your application to the ecology water resources regional office that serves the area where your project would be located. Please refer to the department's website for telephone numbers.

(1) The Northwest regional office serves Whatcom, Island, Kitsap, San Juan, Skagit, Snohomish, and King counties.

(2) The Southwest regional office serves Clallam, Jefferson, Grays Harbor, Mason, Thurston, Pierce, Pacific, Lewis, Wahkiakum, Cowlitz, Clark, and Skamania counties.

(3) The Central regional office serves Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, and Benton counties.

(4) The Eastern regional office serves Ferry, Stevens, Pend Oreille, Lincoln, Spokane, Grant, Adams, Whitman, Franklin, Walla Walla, Columbia, Garfield, and Asotin counties.

□

PART III APPLICATION REVIEW PROCESS

NEW SECTION

WAC 173-157-200 How will the department issue reservoir permits and/or secondary permits for ASR projects? (1) The department will process applications for permits for ASR projects in accordance with the provisions of RCW 90.03.250 through 90.03.320, RCW 90.03.370, chapter 173-152 WAC and this chapter. The department shall expedite processing applications for those projects that:

(a) Will not require a new water right for diversion or withdrawal of the water to be stored;

(b) Are adding or changing one or more purposes of use for the stored water;

(c) Are adding to the storage capacity of the reservoir; or

(d) Are applying for the secondary permit to secure use of water stored in the reservoir.

(2) Any application considered under this chapter will be subject to review by a Washington department of fish and wildlife water rights biologist, specifically to ensure that the following do not occur during or after ASR project diversions or withdrawals:

- (a) Erasure or alteration of natural flow peaks;
- (b) Detrimental changes in temperature and nutrient levels during critical spawning and rearing periods;
- (c) Downwelling or upwelling within stream during critical spawning and rearing periods; or
- (d) Saturation of stream bank which could lead to erosion and bank failure.

The department will consider comments by the water rights biologist in determining whether the project will be detrimental to public welfare.

(3) The department may issue a conditioned permit. For example, conditions may be imposed to prevent any long-term changes to the aquifer. Such conditioning would provide for a pilot phase of the project, to be used to collect data, monitor efficacy, and adjust the plan based upon results.

(4) Permits will contain a schedule for:

- (a) Development and completion of the project;
- (b) Monitoring and reporting during the pilot and operational phases of the project.

(5) The department can, upon a showing of good cause, issue extensions for the permit in accordance with the provisions of RCW 90.03.320.

(6) Once sufficient information is developed and provided to the department to verify that the project is indeed viable and the requirements of RCW 90.03.330 have been met, the department will issue the reservoir and secondary permit certificate with the priority date or dates based on the underlying source or sources of water right.

□

Reviser's note: The spelling error in the above section occurred in the copy filed by the agency and appears in the Register pursuant to the requirements of RCW 34.08.040.

NEW SECTION

WAC 173-157-210 Can I appeal a decision made by the department on my application?

Yes, all final written decisions of the department made on applications pursuant to this chapter are subject to review by the pollution control hearings board in accordance with the provisions of chapter 43.21B RCW if you comply with the requirements for appeal established by statute and rule.

□

NEW SECTION

WAC 173-157-220 Can this regulation be reviewed or updated? Yes, the department may initiate a review of the rules established in this chapter whenever new

information, changing conditions, statutory modifications, or other factors make it necessary or desirable to consider revisions.

□

NEW SECTION

WAC 173-157-230 Where can I obtain copies of ecology statutes and regulations? Copies of statutes and regulations cited in this chapter may be obtained from the public records office at the department's headquarters office. You may also obtain copies by downloading documents from the department's internet site at <http://www.ecy.wa.gov> or copies of rules of the pollution control hearings board from the pollution control hearings board's internet site at <http://www.eho.wa.gov>.

Comment Period Continuation

WSR 02-19-077
PROPOSED RULES
DEPARTMENT OF ECOLOGY

[Order 02-06 -- Filed September 16, 2002, 12:16 p.m.]

Continuance of WSR 02-15-181.

Preproposal statement of inquiry was filed as WSR 02-08-073.

Title of Rule: Chapter 173-157 WAC, Underground artificial storage and recovery.

Purpose: The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and standards for identification and mitigation of potential adverse impacts to ground water quality or the environment.

This continuance is being filed in order to respond to the requests the department received to extend the comment period beyond September 9. The Department of Ecology has agreed to accept comments through September 16, 2002.

Statutory Authority for Adoption: RCW 90.03.370 (2)(b), 90.44.460.

Statute Being Implemented: RCW 90.03.370, chapter 90.44 RCW.

Summary: Chapter 173-157 WAC outlines the process the Department of Ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Name of Agency Personnel Responsible for Drafting: Kathleen Ensenat, Department of Ecology, Headquarters, (360) 407-6780; Implementation and Enforcement: Joe Stohr, Program Manager, Department of Ecology, Headquarters, (360) 407-6602.

Name of Proponent: Department of Ecology, governmental.

Agency Comments or Recommendations, if any, as to Statutory Language, Implementation, Enforcement, and Fiscal Matters: This will create a "third line" for processing permits for applicants that already hold a right to the source water.

Rule is not necessitated by federal law, federal or state court decision.

Explanation of Rule, its Purpose, and Anticipated Effects: The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and, standards for identification and mitigation of potential adverse impacts to ground water quality or the environment. Chapter 173-157 WAC outlines the process the Department of Ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

Under this proposal, an application for a reservoir permit for an ASR project must contain, at a minimum:

- (1) A general description (conceptual model) of the hydrogeologic system prepared and certified by a hydrogeologist licensed in the state of Washington.
- (2) A project operation plan with a general description of the pilot and operational phases of the ASR project prepared and certified by an engineer or geologist licensed in the state of Washington.
- (3) A description of the legal framework for the proposed project.
- (4) An environmental assessment and analysis of any potential adverse conditions or potential impacts to the surrounding environment that might result from the project.
- (5) A project mitigation plan, if required.
- (6) A project monitoring plan.

Proposal does not change existing rules.

No small business economic impact statement has been prepared under chapter 19.85 RCW. A small business economic impact statement is not required because the substantive requirements for obtaining an ASR permit are mandated by RCW 90.03.370 (2)(a). Furthermore, those requirements are essential to prevent infringement on existing water rights and environmental damage from improper ASR design or operation.

RCW 34.05.328 applies to this rule adoption. It has been determined that this rule would be considered a significant legislative rule. Therefore, the requirements of RCW 34.05.328 are being met.

Hearing Location: No additional hearings will be held. Comments may be mailed, faxed, or submitted electronically at <http://www.ecy.wa.gov/programs/wr/asr/asr-home.html>.

Assistance for Persons with Disabilities: Contact Christine Corrigan by 5:00 p.m. on September 16, 2002, TDD (360) 407-6006 or (360) 407-6607.

Submit Written Comments to: Kathleen Ensenat, 300 Desmond Drive, Lacey, WA 98504, Kspa461@ecy.wa.gov, phone (360) 407-6780, fax (360) 407-7162, comments must be received by 5:00 p.m. on September 16, 2002.

Date of Intended Adoption: November 9, 2002.

September 12, 2002

Linda Hoffman

Deputy Director

B. Final Rule Language

Chapter 173-157 WAC

UNDERGROUND ARTIFICIAL STORAGE AND RECOVERY

PART I INTRODUCTION

NEW SECTION

WAC 173-157-010 What is the purpose of this rule? The purpose of this rule is to establish the standards for review of applications for underground artificial storage and recovery projects and, when necessary, to identify options for mitigation of potential adverse impacts to ground water quality or the environment. The rule also outlines the process the department of ecology will use to evaluate applications and issue permits to artificially store water in underground geological formations and subsequently recover it for beneficial use.

NEW SECTION

WAC 173-157-020 What is the authority for this rule? In 2000, the Washington state legislature passed Engrossed Second Substitute House Bill 2867 (E2SHB 2867), which amended chapters 90.03 and 90.44 RCW. This bill expanded the definition of "reservoir" in RCW 90.03.370 to include "any naturally occurring underground geological formation where water is collected and stored for subsequent use as part of an underground artificial storage and recovery project." Projects of this type are more commonly known as "aquifer storage and recovery" or "ASR" projects. The legislation directed the department to adopt rules establishing the "standards for review and standards for mitigation of adverse impacts for an underground artificial storage and recovery project." The department of ecology promulgates this rule under the authorities provided in chapter 34.05 RCW and RCW 90.03.370.

NEW SECTION

WAC 173-157-030 To whom does this rule apply? This rule applies to any firm, association, water users' association, corporation, irrigation district, municipal corporation, or anyone else that intends to obtain a reservoir permit to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370. This chapter does not apply to projects utilizing irrigation return flow, or to operational and seepage losses that occur during the irrigation of land, or to water that is artificially stored due to the construction, operation, or maintenance of an irrigation district project, or to projects involving water reclaimed in accordance with chapter 90.46 RCW.

NEW SECTION

WAC 173-157-040 What are the meanings of words and phrases used in this rule? "Aquifer storage and recovery project," "ASR project," or "underground artificial storage and recovery project" means those projects where the intent is to artificially store water in an underground geological formation through injection, surface spreading and infiltration, or other department-approved method, and to make subsequent use of the stored water.

"Artificial recharge" means either controlled subsurface addition of water directly to the aquifer or controlled application of water to the ground surface for the purpose of replenishing the aquifer.

"Beneficial use" includes, among others, uses for domestic, stock watering, industrial, commercial, agricultural,

irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, thermal power production, municipal, and preservation of environmental and aesthetic values.

"Confined aquifer" means an aquifer where the permeability of the beds above and below the aquifer is significantly lower than the aquifer itself.

"Department" means the Washington department of ecology.

"DOH" means the Washington department of health.

"Hydraulic continuity" means the existence of some degree of interconnection between two or more sources of water, either surface water and ground water or two ground water sources.

"Hydrogeology" means the study of the geologic aspects of subsurface waters.

"Normative flow" means a flow that resembles the natural flow sufficiently enough to sustain all life stages of several species native to the state of Washington, including salmonid populations.

"Permeability" means the ability for a fluid to be transmitted in porous rock, sediment, or soil.

"Piezometric elevation" means the static level to which the water from a given aquifer will rise under its full head.

"RCW" means the Revised Code of Washington.

"Receiving aquifer" or **"reservoir"** means any portion of a naturally occurring underground geological formation in which the source water will be collected and stored for a future beneficial use as part of an ASR project.

"Reservoir permit" means a permit to artificially store water in underground geological formations and subsequently recover it for beneficial use.

"SEPA" means the State Environmental Policy Act, chapter 43.21C RCW.

"Secondary permit" means a permit for the appropriation of ground water which was artificially stored in underground geological formations for subsequent beneficial use.

"Source water" means water that will be stored in a receiving aquifer.

"Stored water" means water that has been stored in a receiving aquifer pursuant to a reservoir permit issued in accordance with the provisions of this chapter.

"Transmissivity" is a measure of the rate which water passes through the geologic material within an aquifer.

"UIC" means the Underground Injection Control program, which was created by the U.S. Environmental Protection Agency pursuant to federal legislation (the Safe Drinking Water Act) and is administered by the department's water quality program.

"Vadose zone" means within the zone of aeration, i.e., water vapor above the saturation zone within an aquifer.

"WAC" means Washington Administrative Code.

"WDFW" means the Washington department of fish and wildlife.

"You" and "I" means any firm, association, water users' association, corporation, irrigation district, municipal corporation, or anyone else that intends to obtain a reservoir permit to develop an underground artificial storage and recovery project pursuant to RCW 90.03.370.

NEW SECTION

WAC 173-157-050 What authorization is required for an ASR project? The following permits or authorizations are required:

(1) **Water rights to source waters.**

(a) Any source water you use as part of a project by diverting from a state watercourse or withdrawing state ground waters, must be obtained under a valid water right permit, certificate, or registered water right claim.

(b) The underlying water right specifies authorized uses. Any proposal to use stored water for different uses will require issuance of a secondary permit.

(2) **Reservoir permit.** When proposing to collect and store water in a naturally occurring underground geological formation for subsequent use as part of an ASR project, you must apply for a reservoir permit in accordance with the provisions of RCW 90.03.370 (2)(a).

(3) **Secondary permit.** You must apply for a secondary permit in accordance with the provisions of RCW 90.03.370 if you propose to apply the water stored in a reservoir to a beneficial use, except that you are not required to apply for a secondary permit if you already have a water right for the source water that authorizes the proposed beneficial use.

(4) **UIC registration.** All UIC wells to be utilized as part of an ASR project must be registered with the department in accordance with the provisions of chapter 90.48 RCW. Additionally, the construction and technical aspects of the injection wells must abide by UIC regulations as stated in chapter 173-160 WAC.

(5) **NPDES permit.** Discharges to surface water must meet water quality standards set forth in chapter 173-201A WAC to protect aquatic life.

PART II APPLICATION PROCESS

NEW SECTION

WAC 173-157-100 What should I know before I apply? (1)

You must assess potential impacts to the hydrogeologic system and the environment prior to submitting your application. If your application does not describe the general setting and conditions with sufficient information for the department to assess the application, the department may require you to perform a detailed feasibility study. This feasibility study should reduce uncertainty of the impacts, and better quantify the available storage capacity of the aquifer.

(2) To further reduce uncertainty, you must design a pilot phase for the project, to be used to collect data that will be used to validate the conceptual model, monitor efficacy, and adjust the monitoring, operation, and mitigation plans based upon results. The duration of this phase will be determined by the complexity of the project and stated within the reservoir permit.

(3) You may schedule a preapplication meeting with the department to discuss the project plan and likely requirements for monitoring and mitigation.

NEW SECTION

WAC 173-157-110 What types of information will I need to provide as part of my application? Your application for an ASR project must contain, at a minimum:

(1) A description (conceptual model) of the hydrogeologic system (see WAC 173-157-120) prepared by a hydrogeologist licensed in the state of Washington.

(2) A project operation plan (see WAC 173-157-130) with a description of the pilot and operational phases of the ASR project prepared by an engineer or geologist licensed in the state of Washington.

(3) A description of the legal framework (see WAC 173-157-140) for the proposed project.

(4) An environmental assessment and analysis (see WAC 173-157-150) of any potential adverse conditions or potential impacts to the surrounding ecosystem(s) that might result from the project, along with a plan to mitigate such conditions or impacts.

The environmental assessment will establish whether a determination of nonsignificance or an environmental impact statement is required per SEPA regulations.

(5) A project mitigation plan (see WAC 173-157-160), if required.

(6) A project monitoring plan (see WAC 173-157-170).

NEW SECTION

WAC 173-157-120 What must I include in the hydrogeologic system description? Your hydrogeologic system description must include a conceptual hydrogeologic model that describes:

(1) The aquifer targeted for storage, to include at a minimum estimates for:

- (a) Lateral and vertical extent;
- (b) Whether the aquifer is confined or unconfined;
- (c) Permeability;
- (d) Total storage volume available;
- (e) Effective hydraulic conductivity;
- (f) Transmissivity; and
- (g) Potential for physio-chemical changes in the aquifer or vadose zone as a consequence of recharge.

(2) The estimated flow direction(s) and rate of movement.

(3) The anticipated changes to the ground water system due to the proposed ASR project.

(4) The estimated area that could be affected by the project.

(5) The general geology in the vicinity of the proposed project, including stratigraphy and structure.

(6) The locations of existing documented natural hazards that could be affected or exacerbated by the project, such as landslide-prone areas or areas of subsidence along with a plan to mitigate such conditions or impacts.

(7) The locations of surface waters such as springs, creeks, streams or rivers that could be affected by the ASR project.

(8) The locations of all wells or other sources of ground water of record within the area affected by the project.

(9) The chemical and physical composition of the source water(s) and their compatibility with the naturally occurring waters of the receiving aquifer.

NEW SECTION

WAC 173-157-130 What must I include in the project operation plan? Your project operation plan should include, at a minimum, the following information:

(1) The quantity and times of year source water is available for recharge.

(2) The proposed rate of injection and withdrawal of water.

(3) The length of time the water is proposed to be stored.

(4) The location, number, and capacity of proposed recharge wells or infiltration basins, and recovery facilities.

(5) Any variability in quality and reliability of the source water.

(6) A description of any water treatment method(s) you will use at the time of injection and recovery to ensure compliance with the water quality standards set forth in chapter 173-200 WAC, as well as the department's antidegradation policy.

(7) Any plans to discharge ASR water to a surface body should include information on the quantity, timing, duration, and water quality parameters such as chlorine, pH and dissolved oxygen of the ASR discharge water.

(8) Any operation and maintenance plans to discharge ground water and suspended sediment from the ASR well shall provide information on the quantity, duration, quality, and means of discharge.

(9) Destination(s) and permitting for water used for operation and maintenance (e.g., flushing water).

NEW SECTION

WAC 173-157-140 What must I include in the description of the legal framework? Your description of the legal framework should include, at a minimum:

(1) Documentation of the water rights for the source waters intended to be stored for the proposed ASR project.

(2) A list of other water rights within the ASR project area.

(3) Instream flows established by the department or stream closures in the vicinity of the point of diversion/withdrawal of the source water and/or within the ASR project area.

(4) Ownership and control of any facilities to be used for the proposed project.

NEW SECTION

WAC 173-157-150 What must I include in the environmental assessment and analysis? Your environmental assessment and analysis must, at a minimum, describe:

(1) The environment within the ASR project area, including:

(a) Proximity to contaminated areas;

(b) Present and prior land use(s) within the ASR project area;

(c) Location(s) of historical or existing wetland habitat(s);

(d) Location(s) of historical or existing flood plain(s);

(e) Location(s) of historical or existing surface water body or spring, including documented:

(i) Base flows;

- (ii) Seven-day low flows;
- (iii) Maximum flows.
- (2) Adverse impacts to the surrounding environment by the ASR project, including, but not limited to:
 - (a) Slope stability;
 - (b) Wetland habitat;
 - (c) Flood plain;
 - (d) Ground deformation;
 - (e) Surface water body or spring.
- (3) If an environmental assessment has already been performed for the purposes of this specific ASR project, the application may simply refer to that documentation and need not repeat that analysis.

NEW SECTION

WAC 173-157-160 What must I include in the project mitigation plan? Your project mitigation plan, if necessary, must be reviewed and approved or prepared by an appropriately experienced engineer licensed in the state of Washington. The mitigation plan shall prescribe actions to be taken to prevent adverse impacts to the environment and methods for evaluation of the effectiveness of these actions.

NEW SECTION

WAC 173-157-170 What must I include in the project monitoring plan? Your project monitoring plan, which will be utilized to evaluate and verify the assumptions in the conceptual model, during the pilot and operational phases, must include the following:

(1) Proposed time intervals for sampling and subsequent reporting.

(2) Descriptions of measurement methodology, threshold values, and evaluation techniques for the following criteria:

(a) The quality of the source and receiving waters. This information must be provided for the period or periods of the year when the water will be stored. Testing must be done by a laboratory certified by either the department or DOH.

(b) The actual quantity of water injected.

(c) Changes in ground water piezometric elevations in the receiving aquifer.

(d) The percentage of the initial amount of stored water that is recoverable after varying lengths of storage time to validate the estimates of the amount of stored water that is actually recovered.

(e) Data necessary to evaluate the effectiveness of required mitigation.

(f) Other data you or the department determine necessary for monitoring the ASR project and adverse impacts.

You must provide a report of the monitoring data, at least annually, to the department. Based on the complexity of the project, the department may require you to comply with a more frequent reporting schedule. The required reporting frequency will be specified in the reservoir permit.

NEW SECTION

WAC 173-157-180 Where do I submit my application for a reservoir and/or secondary permit? You must submit your application to the ecology water resources regional office that serves the area where your project would be located. Please refer to the department's website for telephone numbers.

(1) The Northwest regional office serves Whatcom, Island, Kitsap, San Juan, Skagit, Snohomish, and King counties.

(2) The Southwest regional office serves Clallam, Jefferson, Grays Harbor, Mason, Thurston, Pierce,

Pacific, Lewis, Wahkiakum, Cowlitz, Clark, and Skamania counties.

(3) The Central regional office serves Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, and Benton counties.

(4) The Eastern regional office serves Ferry, Stevens, Pend Oreille, Lincoln, Spokane, Grant, Adams, Whitman, Franklin, Walla Walla, Columbia, Garfield, and Asotin counties.

PART III APPLICATION REVIEW PROCESS

NEW SECTION

WAC 173-157-200 How will the department issue reservoir permits and/or secondary permits for ASR projects?

(1) The department will process applications for permits for ASR projects in accordance with the provisions of RCW 90.03.250 through 90.03.320, RCW 90.03.370, chapter 173-152 WAC and this chapter. The department shall expedite processing applications for those projects that:

(a) Will not require a new water right for diversion or withdrawal of the water to be stored;

(b) Are adding or changing one or more purposes of use for the stored water;

(c) Are adding to the storage capacity of an existing reservoir; or

(d) Are applying for the secondary permit to secure use of water stored in an existing reservoir.

(2) The department shall give strong consideration to the overriding public interest in its evaluation of compliance with ground water quality protection standards.

(3) Any application considered under this chapter that may impact surface waters will be subject to review by the department, WDFW, DOH, and the appropriate Indian tribe(s), specifically to ensure that the following do not occur during ASR project injections or withdrawals:

(a) Alteration of the normative hydrograph which may result in adverse impacts to fish;

(b) Detrimental changes in temperature, nutrient, heavy metals, hydrocarbon, or other deleterious material levels during critical spawning and rearing periods;

(c) Disruption of natural downwelling or upwelling within stream during critical spawning and rearing periods; or

(d) Saturation of stream bank which could lead to erosion, bank failure, and excess sedimentation entering the stream which can alter stream chemistry, flow, and bed morphology.

Each ASR project application will be subject to public notice and comment per RCW 90.03.280. The department will consider any comments by the reviewers in evaluating the application.

(4) The department may issue a conditioned permit to prevent any long-term changes to the aquifer, or other adverse impacts to the environment. The conditioning will provide for a pilot phase of the project, to be used to collect data, monitor efficacy, evaluate the effectiveness of any mitigation plan approved under WAC 173-157-150, and adjust the ASR project or mitigation plan based upon pilot phase results.

(5) Permits will contain a schedule for:

(a) Development and completion of the project;

(b) Monitoring and reporting during the pilot and operational phases of the project.

(6) The department can, upon a showing of good cause, issue extensions for the permit in accordance with the provisions of RCW 90.03.320.

(7) Once sufficient information is developed and provided to the department to verify that the project is viable and the requirements of RCW 90.03.330 have been met, the department will issue proper documentation for the reservoir and secondary permit, if any, with the priority date or dates based on the underlying source water right.

NEW SECTION

WAC 173-157-210 Can I appeal a decision made by the department on my application? Yes, all final written decisions of the department made on applications pursuant to this chapter are subject to review by the pollution control hearings board in accordance with the provisions of chapter 43.21B RCW if you comply with the requirements for appeal established by statute and rule.

NEW SECTION


WAC 173-157-220 Can this regulation be reviewed or updated? Yes, the department may initiate a review of the rules established in this chapter whenever new information, changing conditions, statutory modifications, or other factors make it necessary or desirable to consider revisions.

NEW SECTION

WAC 173-157-230 Where can I obtain copies of ecology statutes and regulations? Copies of statutes and regulations cited in this chapter may be obtained from the public records office at the department's headquarters office. You may also obtain copies by downloading documents from the department's internet site at <http://www.ecy.wa.gov> or copies of rules of the pollution control hearings board from the pollution control hearings board's internet site at <http://www.eho.wa.gov>.

C. Newspaper announcements of Open Houses/Hearings

The News Tribune, Monday, August 19, 2002

**OPEN HOUSE HEARING**
Aquifer storage and recovery
rule proposed

WHEN: Wednesday, Aug. 28, 2002, 5:00 to 8:00 p.m.
WHERE: Lakehaven Center
31531 1st Ave. S., Federal Way

COMMENT PERIOD: Aug. 7 to Sept. 9, 2002


The Dept of Ecology is holding an **open house** on a proposed aquifer storage and recovery (ASR) rule during which **public comments will be collected**. Since the rule is technical in nature, invited representatives from the **Lakehaven Utility District** and the **Sammamish Plateau Water and Sewer District** will be present, in addition to Ecology staff, to provide information and answer questions about ASR.

ASR is the storage of water in an aquifer through an injection well during times when water is available, and recovery by pumping of the water from the same well during times when it is needed. The proposed rule will establish standards for review of ASR project applications and mitigation of any adverse impacts.

For more information, contact: Kathleen Enseñat at (360) 407-6780, email [kspa461@ecy.wa.gov]
Or: www.ecy.wa.gov/programs/wr/wrhome.html

For special accommodation needs or language translation call (360) 407-6607 (voice) or (360) 407-6006 (TDD). Ecology is an equal opportunity employer.

Tri-City Herald, Monday, August 19, 2002

**OPEN HOUSE HEARING**
Aquifer storage and recovery
rule proposed

WHEN: Tuesday, Aug. 27, 2002, 5:00 to 8:00 p.m.
WHERE: Kennewick Mid Columbia Library
1620 S. Union, Kennewick

COMMENT PERIOD: Aug. 7 to Sept. 9, 2002

The Dept of Ecology is holding an **open house** on a proposed aquifer storage and recovery (ASR) rule during which **public comments will be collected**. Since the rule is technical in nature, invited representatives from the cities of **Kennewick, Yakima, and Walla Walla** will be present, in addition to Ecology staff, to provide information and answer questions about ASR.

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D. Focus Sheet



Focus

Proposed rule for Aquifer Storage and Recovery

FOR MORE INFORMATION

Web Page

A copy of the proposed rule plus more details on ASR can be found at:

www.ecy.wa.gov/programs/wr/asr/asr-home.html

Ideas and suggestions can be submitted online.

Rule Questions:
Kathleen Ensenat
(360) 407-6780

email: ksa461@ecy.wa.gov

Policy and Technical Questions:
Doug McChesney
(360) 407-6647

email: dmcc461@ecy.wa.gov

A FORMAL PUBLIC COMMENT PERIOD AND
HEARINGS ON
THE DRAFT RULE WILL BE HELD DURING
AUGUST 2002

A presentation on ASR to organizations
considering a project may be requested by
calling the numbers above.

Projects in Washington

See web page

City of Yakima
Lakehaven Utility District
Kennewick & Richland
Seattle Public Utilities
City of Walla Walla

What is Aquifer Storage and Recovery?

Aquifer Storage and Recovery (ASR) involves injecting water into an aquifer through a well or by surface spreading and infiltration and then pumping it out when needed. The aquifer essentially functions as a water bank. Deposits are made in times of surplus, typically during the rainy season, and withdrawals occur when available water falls short of demand.

What are the benefits?

Some recognized benefits of aquifer storage and recovery are:

- Substantial amounts of water can be stored deep underground. This may reduce the need to construct large and expensive surface reservoirs.
- ASR systems are considered to be environmentally friendly in comparison to building above-ground reservoirs. They also offer more protection from tampering.
- ASR may restore and expand the function of an aquifer that has experienced long-term declines in water levels due to heavy pumping necessary to meet increasing urban and agricultural water needs.

The new Aquifer Storage and Recovery rule

In the 2000 session, the Washington State Legislature expanded the definition of “reservoir” in RCW 90.03.370 to include, “any naturally occurring underground geological formation where water is collected and stored for subsequent use as part of an underground artificial storage and recovery project.

This legislation allows Ecology to issue reservoir permits authorizing ASR projects. Previously, reservoir permits were only for surface water storage projects.

The legislation also directed Ecology to adopt a rule that will establish standards for review of ASR proposals and mitigation of any adverse impacts in the following areas:

- Aquifer vulnerability and hydraulic continuity.
- Potential impairment of existing water rights.
- Geotechnical impacts and aquifer boundaries and characteristics.
- Chemical compatibility of surface and ground waters.
- Recharge and recovery treatment requirements.
- System operation.
- Water rights and ownership of water stored for recovery.
- Environmental impacts

This rule, Chapter 173-157 WAC – Underground Artificial Storage and Recovery, is currently under development.

What is the ASR application process?

Following are the basic steps involved in permitting an ASR project:

1. Prior to applying, assess potential issues and impacts to the hydrogeologic system and the environment. If the general setting and conditions cannot be

described in sufficient detail for the application, then a more detailed feasibility study must be performed. The feasibility study should reduce uncertainty with respect to project issues and impacts, as well as better quantify the available storage within the aquifer.

2. Schedule a pre-application meeting with Ecology to discuss the project plan and likely requirements for monitoring and mitigation.
3. Submit an application for an ASR project that contains at a minimum:
 - Water rights for the source waters for the proposed ASR project.
 - A general description of the physical design of the hydrogeologic system prepared by an engineer or geologist registered in the state of Washington.
 - A general description of the operational design of the hydrogeologic system prepared by an engineer or geologist registered in the state of Washington.
 - A project plan.
 - A data monitoring plan.
 - An environmental assessment and analysis of any potential adverse conditions or potential impacts to the surrounding environment, limited to storage and subsequent use of stored water, that might result from the project.

Water quality issues

Water to be stored in an aquifer as part of an ASR project must meet water quality standards for ground waters of the state of Washington, Ch. 173–200 WAC. Additionally, injection wells for an ASR project must be registered with Ecology in accordance with the provisions of Chapter 90.48 RCW (Water Pollution Control Act) and Chapter 173-218 WAC (Underground Injection Control Program).

For more information or to send informal comments on the draft rule, see the box on page 1.

E. Public Notice of Comment Period

Notice

Comment period, open house hearings on
proposed rule for aquifer storage and recovery



COMMENT PERIOD AUG 7 TO SEPT 9, 2002

Open House Hearings

Kennewick

Tuesday, Aug. 27
5:00 to 8:00 pm
Mid Columbia Library
1620 S. Union

Federal Way

Wednesday, Aug. 28
5:00 to 8:00 pm
Lakehaven Center
31531 1st Ave. S.

For More Information

Web Page

A copy of the proposed rule plus more details on
ASR are on Ecology's website:
[www.ecy.wa.gov/programs/
wr/wrhome.html](http://www.ecy.wa.gov/programs/wr/wrhome.html)

To submit comments

Online: see web page

Mail: Kathleen Ensenat
PO Box 47600
Olympia WA 98504
Fax: (360) 407-6574

Rule Questions:
Kathleen Ensenat
(360) 407-6780
email: kspa461@ecy.wa.gov

Technical Questions:
Doug McChesney
(360) 407-6647
email: dmcc461@ecy.wa.gov

Join the Water Resources email list at
[www.ecy.wa.gov/programs/
wr/wrhome.html](http://www.ecy.wa.gov/programs/wr/wrhome.html)

Open house hearings

The Department of Ecology (Ecology) will
hold two open houses on the proposed
aquifer storage and recovery (ASR) rule
during which public comments will be
collected. (See side bar.)

Since the rule is technical in nature,
invited representatives from cities with
ASR projects will be present, in addition to
Ecology staff, to provide information on
and answer questions about ASR .

Present at the Kennewick open house will
be representatives from the cities of
Kennewick, Yakima, and Walla Walla.

Present at the Federal Way open house
will be representatives from the
Lakehaven Utility District and the
*Sammamish Plateau Water and Sewer
District.*

Definition of aquifer storage and recovery

Aquifer storage and recovery (ASR) involves injecting water into an aquifer through a well or by surface spreading and infiltration and then pumping it out when needed. The aquifer essentially functions as a water bank. Deposits are made in times of surplus, typically during the rainy season, and withdrawals occur when available water falls short of demand.

The new aquifer storage and recovery rule

In the 2000 session, the Washington State Legislature expanded the definition of “reservoir” in RCW 90.03.370 to include, “any naturally occurring underground geological formation where water is collected and stored for subsequent use as part of an underground artificial storage and recovery project.”

This legislation allows Ecology to issue reservoir permits authorizing ASR projects. Previously, reservoir permits were only for surface water storage projects.

The proposed rule, *Chapter 173-157 WAC – Underground Artificial Storage and Recovery*, will establish standards for review of ASR proposals and mitigation of any adverse impacts in the following areas:

- Aquifer vulnerability and hydraulic continuity.
- Potential impairment of existing water rights.
- Geotechnical impacts and aquifer boundaries and characteristics.
- Chemical compatibility of surface and ground waters.

- Recharge and recovery treatment requirements.
- System operation.
- Water rights and ownership of water stored for recovery.
- Environmental impacts.

Benefits of ASR

Some recognized benefits of aquifer storage and recovery are:

- Substantial amounts of water can be stored deep underground. This may reduce the need to construct large and expensive surface reservoirs.
- ASR systems are considered to be environmentally friendly in comparison to building above-ground reservoirs. They also offer more protection from tampering.
- ASR may restore and expand the function of an aquifer that has experienced long-term decline in water levels due to heavy pumping necessary to meet increasing urban and agricultural water needs.

Water quality issues

Water to be stored in an aquifer as part of an ASR project must meet water quality standards for ground waters of the state of Washington, Ch. 173–200 WAC.

Additionally, injection wells for an ASR project must be registered with Ecology in accordance with the provisions of Chapter 90.48 RCW (Water Pollution Control Act) and Chapter 173-218 WAC (Underground Injection Control Program).

For more information or to send comments on the draft rule, see the box on page 1.



News Release

FOR IMMEDIATE RELEASE – Aug. 7, 2002

02-153

Rule proposed for permitting new ‘underground’ reservoirs

OLYMPIA – The public is being asked to comment on a proposed rule regarding how the Department of Ecology (Ecology) will review projects designed to store water underground to be recovered for future uses.

For decades, Ecology has been reviewing and permitting projects designed to store surface water originating from springs, streams or rivers. Most were reservoirs created by dam construction.

In 2000, the state legislature expanded the definition of reservoirs to include water stored in naturally occurring, underground geologic formations. In many areas of the state, it has become increasingly difficult to find new sources of water, thus increasing the appeal of using existing water-bearing formations, or aquifers, to store water.

Water would be artificially injected into an aquifer during times of surplus, such as fall and winter, and then recovered at a later date – usually during emergencies, water shortages or other peak water needs

“Using an aquifer to store water essentially turns it into a water bank,” said Joe Stohr, who supervises Ecology’s water-resources program. “Aquifer storage and recovery offers a safe, reliable way for some communities to provide enough water for their growing populations.”

After the statutory changes took effect, Ecology convened an advisory group comprising representatives from water utilities, consulting firms, academic institutions and local, state and tribal agencies to determine how best to implement the new law. The proposed rule is based on that group’s recommendations to the department.

Stohr said aquifer storage and recovery systems can be more environmentally friendly than surface reservoirs, which often disrupt fish habitat and migration patterns. Storage aquifers also can:

- Offer more protection from potential tampering.

- Eliminate the need to construct large, expensive structures to store surface water.
- Create the potential to expand the use of an aquifer experiencing large fluctuations in water levels due to heavy pumping to meet growing demands.

The public-comment period for the proposed rule starts today and ends Sept. 9. The department will hold two meetings to share information and collect public comments:

- **Aug. 27 in Kennewick** – 5 to 8 p.m. at the Mid-Columbia Library, 1620 S. Union
- **Aug. 28 in Federal Way** – 5 to 8 p.m. at the Lakehaven Center, 31531 First Ave. S.

Staff from the cities of **Kennewick**, **Yakima** and **Walla Walla** will be at the Aug. 27 meeting to answer questions about their specific proposals. The Aug. 28 meeting will include representatives from the **Lakehaven Utility District** in Federal Way and **Sammamish Plateau Water and Sewer District** in east King County.

To receive a copy of the proposed aquifer storage and recovery rule or to submit comments electronically, visit Ecology's Web site at <http://www.ecy.wa.gov/programs/wr/wrhome.html>. Written comments and questions should be mailed to Kathleen Enseñat, Dept. of Ecology, P.O. Box 47600, Olympia, Wash., 98504-7600, or faxed to 360-407-6574.

###

Media contact: Curt Hart, Public Information Manager, 360-407-7139; pager, 360-971-9610

For more information about the rule:

<http://www.ecy.wa.gov/programs/wr/wrhome.html>

For a summary about proposed aquifer storage and recovery projects

across the state: <http://www.ecy.wa.gov/programs/wr/asr/ASRLegRptApdx.pdf>

Ecology's Web site: <http://www.ecy.wa.gov>

Broadcast version

The state Ecology Department is seeking public comment on a proposed rule about how the agency will review underground water-storage projects.

For years, the department has authorized above-ground reservoirs to store water. In 2000, the legislature expanded its definition of a reservoir to include naturally occurring underground geological formations. Ecology now needs to adopt a rule about how to permit such projects.

Public comments are being accepted through September 9th. For more information, contact the Department of Ecology by phone or through the Internet.

G. Open House/Hearing transcripts

KENNEWICK, 8/27

Let the record show it is 5:00 pm on Tuesday, August 27, 2002 and this hearing on the proposed rule *Underground Artificial Storage and Recovery* is being held at the Mid Columbia Library in Kennewick, Washington.

The legal notice of this hearing was published in the Washington State Register on August 7, 2002. Paid notices were published in the Tri Cities Herald and the Tacoma News Tribune on August 19. In addition, notices of the hearing were mailed or emailed to approximately 1500 interested persons.

All testimony presented at this hearing as well as any written comments will be a part of the official record for this proposal and will receive equal weight in the decision-making process. Staff will also take into consideration testimony we hear at the other hearing on this issue we have scheduled in Federal Way on August 28. A decision will be made about adoption in November after the director has had a chance to look at the public comment and staff recommendations. If adopted, the rule will become effective 31 days after adoption.

No oral comments were received for the record and this hearing is adjourned at 8:00 pm.

FEDERAL WAY, 8/28

Let the record show it is 5:00 pm on Wednesday, August 28, 2002 and this hearing on the proposed rule *Underground Artificial Storage and Recovery* is being held at the Lakehaven Center in Federal Way, Washington.

The legal notice of this hearing was published in the Washington State Register on August 7, 2002. Paid notices were published in the Tri Cities Herald and the Tacoma News Tribune on August 19. In addition, notices of the hearing were mailed or emailed to approximately 1500 interested persons.

All testimony presented at this hearing as well as any written comments will be a part of the official record for this proposal and will receive equal weight in the decision-making process. Staff will also take into consideration testimony we heard at the other hearing held on this issue on August 27 in Kennewick. A decision will be made about adoption in November after the director has had a chance to look at the public comment and staff recommendations. If adopted, the rule will become effective 31 days after adoption.

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Let the record show there is no one in attendance and this hearing is adjourned at 5:30 pm.